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ORIGINAL ARTICLES.

THE TREATMENT OF CHRONIC OÖPHORITIS BY LOCALIZED ELECTRICITY.¹

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IN no branch of medicine or surgery does fashion govern our actions and modes of treatment more than in gynecology. Theory after theory, method after method of cure have from time to time been introduced with a great flourish, and, having the glamor of a great name to guarantee their power, have for a while taken a firm hold upon our affections, until some other and perchance better measure has pushed its predecessor aside, only in time to suffer a similar fate. Each, however, has added something to the total of our general knowledge, and assisted us somewhat toward reaching the goal for which we are all striving—perfection in diagnosis and treatment, the reduction, if such be possible, of medicine to an exact science. Thus we have had Bennett with his inflammatory theory; all genital ailments in the female, according to him being dependent upon inflammation of the uterus, which was to be combated vigorously by caustic applications. This for a while prevailed, and every physician wielded his speculum and his little stick of silver nitrate. Then came Graily Hewitt and his assertion that all depended upon uterine displacements; and pessaries, big and little, round and square, thick and thin, and of almost inconceivable shapes, were forced into the vagina, and the average female trotted about encumbered like a pack-mule, only her load was carried not without but within, there to do its best or worst unseen. Reaction, however, set in, though still to-day pessaries are used rather indiscriminately. Then came Tilt, with his ovarian theory; but this influenced practice but little at the time, though at present there seems to have been a revival of it. Following this we had Marion Sims, with his operative craze, and this has gone on growing and growing almost up to the present day, until it has become a very serious matter for a woman to consult a gynecologist, whether urban or suburban, for fear that the verdict may be, "out with your ovaries," or some other form of operative interference. But,

thank the good Spirit that watches over us poor physicians, the reaction has set in at last, wiser counsels are beginning to prevail, and from time to time a voice, feeble though it be, is raised, and we hear protests against indiscriminate and needless operations. Like its predecessors, the operative method will take its proper place, and those only will be submitted to cutting in whom the indications justify such interference.

We are now entering upon a new phase in gynecology; in fact the road is already long behind us, though considerable ground yet remains to be covered. That mysterious yet extremely manageable force, electricity, which the laity so dread, and which we physicians so little understand, is rapidly taking its place among the active agents employed to combat female ailments, and all around us we hear praise or blame, one staking his all on electricity, another maintaining its absolute uselessness. Between these widely opposed factions it is our duty as unbiased judges to learn the truth, and thus determine the proper standing of electricity. Electricity as a curative agent in gynecology is not a new thing, but up to within a comparatively short period, even as late as 1884, it was used in such an irregular, unscientific, and erratic manner that all deductions based on such use were absolutely worthless from a practical point of view. Uniformity of application was an unknown thing, and as regards dosage, means were not at hand to measure the amount given, the number of cells determining in an uncertain and unreliable way the current-strength, the poles being used without any knowledge of their special actions; while such batteries as were to be obtained were crude and extremely uncertain in action, having more humors than a spoiled child. All this is now changed, cells are being steadily perfected, so that they can be depended upon to work in a definite way when work is required, the results of weak and strong currents are gradually being made known to us, the different effects of the individual poles are matters which now can be positively foretold, while instruments for accurate measurement and the gradual turning on or off of the current are at the command of all.

It has been my privilege during quite a number of years to have carefully investigated the various applications of electricity in gynecology, and, although my applications now amount to a very large number in the treatment of the various genital

¹ Read at the Tenth Annual Meeting of the Fifth District Branch of the New York State Medical Association, held in Brooklyn on May 22, 1894.

affections in the female, in no one of them have I found this agent more useful than the one we are now about to consider.

As a clinical entity chronic oöphoritis is of comparatively frequent occurrence, more so, in fact, than is generally supposed, though pathologically its existence is somewhat more often made evident by changes discoverable upon the post-mortem table alone, changes which during life were unsuspected. Thus it is probable that fully 2 per cent. is the margin between clinical and pathologic diagnosis. During a series of years every gynecologic case presenting itself to me had the ovaries carefully interrogated, even when there were no symptoms referable to these organs, and among 5262 such cases of genital disease 289, or 5½ per cent., were found suffering from the disease in question. Such cases were very rarely simple, although occasionally so, uncomplicated oöphoritis being an exceedingly rare affection; but they were almost invariably conjoined with some other genital disease, endometritis most frequently, or some form of tubal disease. On the post-mortem table both Pollock and Hennig have found the malady in about 8 per cent. of all cases examined. We thus note, as before stated, that about 2 per cent. go undiagnosed during life. Nor is this surprising when we remember the difficulties surrounding the examination of the ovaries. Every pain in the region of these organs does not necessarily mean their disease, nor does its absence indicate absolutely a healthy organ. I have seen a number of cases in which examination alone revealed the presence of advanced ovarian disease, there being nothing outside of physical examination pointing to the existing chronic oöphoritis. The diagnosis of disease of the pelvic organs, as we all know, even in the hands of the most expert, is often a very doubtful matter, which operation alone can clear up, and even then, after the offending organs are removed, the doubt can at times be solved by the microscope alone. Only a short time since I was present at a celiotomy, the right ovary and tube being removed by one of the most expert and well-known of New York's celiotomists, yet even after removal the diagnosis remained unmade. Before operation the case was supposed to be one of pyosalpinx, yet during and after removal absolutely no indication of pus could be found, the ovary itself being perfectly normal, while a number of small communicating cysts were found in the broad ligament beneath the tube, which the operator thought might possibly be the remains of an old ruptured extra-uterine pregnancy, but decided to await the results of microscopic examination before expressing a positive opinion.

Considering then about 6 per cent as the detectable frequency of chronic oöphoritis, making the disease a comparatively frequent one, the important

question arises, the diagnosis being accurately made, What shall we do in the way of cure? Up to within a comparatively short period but two methods were available, the relatively mild medical measures or the radical one of the knife. Of late, however, a third method claims our attention—disputing the palm with surgery—electricity, whether in the form of the direct or constant current, galvanism, or the indirect or interrupted current, faradism.

A new measure, before it can lay any claim to recognition, must have certain advantages over the older ones, and must be positive, capable of proof and easy of demonstration. If we have an old ruin which we are desirous of replacing by a more modern and stable building, we would not proceed to build directly upon the old, but rather would first remove it to give place to a newer and a better structure, using, perhaps, such parts of the old as are still of value. Now, I do not mean to say that either medicine or surgery are ruins as far as chronic oöphoritis is concerned, but what is claimed is that in a large number of cases the former means are absolutely useless, while a resort to the latter will be found unnecessary after a fair, sufficient and unbiased trial of the agent here recommended.

Medical measures alone against this disease, it can easily be shown, are almost valueless. In recent cases they may succeed sometimes, in old-standing ones absolute failure is almost always the rule.

Such has been the experience of most who have written upon the subject, and such has been mine after many trials of many and diverse agents. "Now a few words on the treatment," says J. Matthews Duncan, than whom there has seldom been a closer and more accurate observer, speaking of this very disease, "and I begin by telling you that you will find a great many cases to be chronic, and this is almost a synonym for incurable. I advise you, indeed, in many cases which resist a properly conducted treatment, to give up the attempt at cure. You will only bother your patient, make her a valeudinarian, and do her harm by further persistence in attempting to cure a disease which proper treatment has failed to remove." Goodell, another acute observer, remarks: "Very little can be said as to the medical treatment of disease of the appendages. It has been dogmatically stated that no treatment other than surgical can be of any relief, yet we are forced to admit that the treatment by drugs and local applications is usually unavailing, although this is due in part to the fact that we seldom see these cases early enough in the disease." Others have expressed similar opinions, and further clinical experience but proves such to be true. We may sometimes temporarily relieve by drugs, whether applied locally or administered internally, but a cure is but seldom obtained, and then only in what

may be termed recent sub-acute cases. Chronic oöphoritis, it is my firm belief, is rarely amenable to medical measures alone.

Medicine having failed, a resort to surgery was but natural. Surgery, being a radical curative measure, which entails a certain danger to life, must be radical in its results. It must cure quickly and thoroughly, and must not be followed by results which are as serious and distressing as the original disease for which it was employed. Oöphoritis in itself, complicated as it almost always is, carries but little danger to life with it, its complications alone constituting its dangerous elements, and even then pus-tubes and ovarian abscess being the only ones that make it dangerous to life. Hence, abscess aside, if surgery does not do what it claims to do, with minimum risks and maximum benefits, it should be set aside for a safer if only equally beneficial measure. That surgery frequently does not do what it claims to do I hope here to show.

1. The operation of salpingo-oöphorectomy is dangerous to life. Take the most skilful specialists, and their operations will show a certain death-rate, the very best and confessedly a remarkable one not falling below 3 per cent.; the majority having a mortality decidedly higher than this. True, many of these operations are for diseases of the tubes; but as in both cases the manipulations, methods and technique are the same, while the two forms of disease are usually conjoined, no wide variation in mortality is probable, whether the operation be directly for oöphoritis or for salpingitis. Oöphoritis, although generally complicated, is, as before stated, but rarely dangerous to life, the large majority of its complications, as evidenced by my experience in 250 cases, residing in the uterus itself in about 90 per cent., while the tubes were involved in only about 15 per cent. of all cases, excluding instances of catarrhal salpingitis. The only truly dangerous complication is distention of the tubes, especially when due to pus, and this condition is in my experience found in only about 8 per cent. of all examples of oöphoritis. Considering all cases, no matter what the complication, we may safely conclude that fully 90 per cent. of all instances of chronic oöphoritis carry absolutely no danger to life with them, but simply entail suffering and chronic invalidism. From this point of view, save only as regards coexisting pus-tubes and ovarian abscess, the necessity of a resort to surgery, therefore, must be looked upon as more than doubtful. To subject a patient to the risk of losing her life by operation when life is not endangered by the disease itself is not right, either in logic or in ethics, except, perhaps, only when all other measures have failed and to live on, suffering, has become unbearable. It is not enough to have tried medical measures alone, for these, as we have already shown, most often fail.

The agent here recommended should be given a fair trial also, and if this be done the probabilities are that the knife will not be needed, except in a rather small number of cases.

It is to be understood that I am speaking only of cases of chronic oöphoritis without complicating pyosalpinx or other abscesses, the presence of pus in the pelvis being to me always and invariably a contra-indication to the use of electricity in the treatment of any form of pelvic disease, all other complications, excepting acute inflammation here, interfering in no way with the use of this agent. Apropos of the foregoing, I can do no better than quote the following, by so able, conservative, careful, and conscientious an observer as Goodell: "The death-rate from chronic diseases of the appendages is greatly overrated, so much so that, in my opinion, more deaths result from the operation of removing the tubes and ovaries in the hands of even the most successful gynecologist than from the disease itself." Only a short time since I read the following by Dr. Reamy, of Cincinnati (in the *American Journal of Obstetrics and Diseases of Women*, April, 1894, p. 525):

In forty years I have not seen five cases of death directly traceable to ruptured pus-tubes. And I doubt if the gentleman's experience has been different. I will go further, and make the statement, the truth of which cannot be controverted by the facts, viz., that in the gentleman's own practice during the last five years more women have died after he has operated upon them for the removal of diseased tubes and ovaries, as a result of the operation, than have died among an equal number of women presenting the same symptoms of pus-tubes and pus-ovaries, in the same community, and who were not operated on at all. In making this statement I make no reflection upon the gentleman's operative skill. On the contrary, I assert that the same comparison will hold true of my own work or that of any other gentleman present. It is a principle and the exhibition of clinical truth that I seek.

Comment upon such statements from gynecologists of such large experience is unnecessary.

2. Operators themselves are becoming dissatisfied with the results. Emmet believes that the value of the operation of oöphorectomy, meaning thereby removal of tube and ovary, is very much more limited than Tait, its author, would have us believe. Lusk writes: "The more the question is studied the more clear it becomes that the loss of her ovaries does make a difference to a woman. It is time to echo in this country Doléris' cry in France: 'Too many useless mutilations; not enough conservative gynecology.'" The late Dr. C. C. Lee was convinced that something must be radically wrong, and that an evident necessity existed for the clearer demarcation of cases appropriate and inappropriate for operation. Doléris believes that eight-tenths of the women operated upon have submitted needlessly to mutilation. Having the best of opportunities

for seeing a large number of gynecologic cases, Doléris had come to believe that conservative treatment was usually more successful than the radical operation in the cure of pelvic inflammations. "The latter," he writes, "may be justifiable for myoma and encysted abscess of the tubes, but when constantly undertaken for follicular ovaritis, catarrhal salpingitis, for pelvic neuralgia, and real or pseudo-hysteria, the subject will bear a little investigation." Mundé, in a paper on the "Conservative Treatment of Salpingitis," remarks: "I believe the time has come when it is well for those of us who are doing abdominal work habitually, and as a matter of our almost daily routine, to take the field against the hasty and habitual removal of the uterine appendages simply because they happen to be more or less diseased."

Thus I might go on quoting writer after writer, all to the same effect, but of what use multiplying complaints when the fact is patent that operators themselves have become dissatisfied. Of late years quite a large number of papers have appeared advocating conservatism, both in the proper selection of cases, as well as in the frequency and plan of operation; and the names of Lusk, Mundé, Polk, and Goodell at home, and Doléris, Pozzi, and Martin abroad but emphasize these pleas for greater care and circumspection. All these cries for conservatism only indicate the dissatisfaction with the results obtained following oöphorectomy. If the masters complain, we ordinary mortals must bow the head in assent.

3. The results are not as radical as the operation. Even the surgeons, as we have already indicated, admit this, though claiming better results than facts would seem to warrant. Thus Skene Keith reports among 23 operations, 19 cures, 2 failures, and 2 instances of improvement only. Keppler in 46 operations met with 39 cures. Boldt in 112 operations had 58 cures, 10 failures, 24 in which improvement only was obtained, and 11 that were either not heard from or in which insufficient time had elapsed to note results; besides these he had 8 deaths. Dr. John Williams maintained, and he was not contradicted, that "in so far as he could gather from the most reliable statistics, about 30 per cent. of patients from whom diseased appendages were removed were cured by operation, many more were benefited and cured by time and other treatment, while the rest continued to suffer." Doran observes that oöphorectomy for chronic disease of the appendages, is, as a rule, followed by speedy convalescence; but, unfortunately, a permanent cure is not so frequent, while in a considerable minority the pains which preceded the operation continue. One of the latest authoritative expressions, from the point of view of the specialist, is that of Dr. Howard A.

Kelly in Hare's *System of Therapeutics* (1892, vol. iii, p. 814), which reads as follows, speaking of operations for ovaritis and salpingitis: "Cases which recover promptly from the operation may even continue to suffer just as before; and under the most favorable circumstances the patient goes through a prolonged convalescence, and if she makes a perfect recovery she is usually a year in reaching full health."

The late Dr. C. C. Lee, a careful observer, made it a point to keep track of his operated patients as long as possible, so as to note ultimate effects. Thus he collected 26 of such cases, having kept them under observation for a long time, with the following results: 15 were completely or comparatively successful, 7 were only partially benefited, while 4 were absolute failures. The beneficial effects of the operation, however, only followed after a considerable period of time, the pain persisting often for one or two years to a greater or lesser degree, absolute relief becoming evident only after considerable time had elapsed. In 16 instances only did this distressing symptom entirely disappear after one or more years of further suffering, in 8 instances the relief was never more than partial, while in 2 others no change at all was noted. In 21 of these 26 cases there was some form of oöphoritis or ovarian descent present, and considering pain as the pivotal symptom, in 11 only was the cure in these cases complete; in the other 10 only partial benefit being obtained. Such results as the foregoing certainly do not speak in very flattering terms in favor of such a radical operation as oöphorectomy. To endanger life without corresponding great benefit as the result of such risks incurred is not a very alluring commentary upon the wisdom and conservatism of celiotomists.

4. There are certain after-effects following removal of the appendages which entail as much suffering and danger upon the patient as the disease for which the operation was originally undertaken, if not more.

The artificial menopause, which is thus brought about, is extremely slow in its completion, and is accompanied by much annoyance and suffering. This is a well-recognized fact to-day. Menstruation often persists for some time, either regularly or irregularly, even after absolute removal of both ovaries and tubes, occurring 8 times in 19 instances in my experience, carrying with it the continuance of all symptoms previously referable to that function. If the menopause be brought about, its slowness of appearance but prolongs the flushings, the sweatings, the confusion of ideas, the headaches, the sleeplessness, and the other hundred-and-one petty annoyances that so commonly accompany the physiologic establishment of this change, only intensified and prolonged by its artificial production.

Such is the opinion of Goodell, and also of Hegar, who says that "the artificial menopause, induced by the operation is often attended with more serious complications than those which are not rarely observed in the natural change of life." (*Brit. Med. Journal*, December, 1886, p. 1280.) Melancholia and even absolute insanity are not uncommon, more often, apparently, than after other operations. Glavecke, as quoted by Goodell, declares that "in almost all cases the mind becomes more or less affected, and not infrequently melancholia results." In fact he noted actual melancholia in 11 of 33 cases of which he was able to obtain accurate information; while Lee observed depression in 9 of the 26 cases of which he was able to obtain subsequent records.

The sexual sense is often abolished, while dyspareunia either persists if previously present, or may even be instituted by the operation, as I have seen. This loss of desire was formerly maintained not to occur, the reverse being claimed, but further experience has shown that with the removal of the ovaries, the desire for sexual congress is often gradually lost, entailing much unhappiness and conjugal dissatisfaction. Besides, the ability to procreate is forever gone, and in several instances in my experience this has led to the abandonment of the wife by the husband. "My own experience," says Goodell, "would lead me to the conclusion that in the majority of women who have been castrated the sexual impulse soon abates in intensity, much sooner than after a natural menopause, and that in many cases it wholly disappears." Zweifel has found, as the result of the examination of 26 cases, that desire was lost in 3, weakened in 3, unchanged in 10, while it had never existed in 10 others. Lee also found the sexual appetite diminished in 3 of 11 cases. That is, in about one-third of all instances of salpingo-oophorectomy the sexual appetite was more or less affected unfavorably.

Intestinal obstruction due to constricting bands occasionally occurs. Dr. Carl Beck has met with two such cases, and claims to know of a half a dozen similar ones. Operation here becomes imperative, and deaths are not uncommon.

Abdominal hernia is another sequel to the operation that sometimes occurs, involving the danger of strangulation and death, and either requiring the wearing of a truss or necessitating the recourse to a second operation for its cure.

Fistulae, either simple or fecal, sometimes follow, constituting a source of great annoyance and discomfort, and making life more miserable than the original disease, and usually also calling for a second resort to surgery.

Within the pelvis many changes causing distressing symptoms may result from the operation, such as adhesions between bowel and uterus, or uterus

and bladder, or uterus and the other surrounding parts, the effects of a pelvic peritonitis consecutive to the operation. Symptoms arising from such adhesions are unusually distressing and persistent, and almost impossible of relief.

During a number of years I have personally met with, interrogated, and carefully examined thirty-one cases of oophorectomy performed by some of the most skilful operators in New York City, the results in almost every case being not particularly flattering to the operator; the intervals intervening between operation and examination varying from two months to seven-and-a-half years, the average interval being one-and-a-half years. Of these thirty-one cases only two may be considered to have been cured by surgery. The other twenty-nine continue to suffer, some less than formerly, others as bad as ever, while still others are, if anything, worse. Thus, considering pain as one of the deciding symptoms, and it is usually this that brings the patient to the surgeon, in only seven was it absent, once it was described as being diminished in intensity, five times unchanged, five times as still "considerable," nine times as still great, and four times as increased; in one of these last instances the patient describing her sufferings as "terrible." A careful analysis of these thirty-one cases shows that in a few only was benefit actually obtained, while in almost all of them but little or nothing was practically accomplished; some, in fact, being really made worse. Thus, in nineteen instances in which both ovaries were removed menstruation persisted in three for a short time, finally to disappear entirely; while in seven others it had continued up to the time of coming under observation; in four irregularly, in two regularly, and in one it was too frequent and very profuse. When one ovary only was removed menstruation persisted in all, regularly in seven, irregularly in three, and too often in two instances. Four times was dysmenorrhea complained of, two of those in whom but one ovary was extirpated describing as intense their sufferings at the time of the flow.

Pain, either pelvic, abdominal, or lumbar, had continued in all but seven cases. Sometimes diminished, though usually unchanged, it was in some instances described as aggravated; in fact, in one case the patient maintained that it had been instituted by the operation. Benefit in some cases followed quickly, but was only temporary, and with time the pain recurred as badly as or even worse than before.

Nervous symptoms closely approximating those indicative of the physiologic menopause were present in thirteen of the nineteen cases wherein both ovaries were removed, while observed in only four of the twelve instances of removal of one ovary. These were persistent during a long period of time,

showing but little evidence of abatement, and were the source of extreme suffering, both mental and physical, rendering life miserable and a burden both during waking and sleeping hours. Hysteria, sometimes of a severe type, existed in seven cases; while headaches were bitterly complained of in as many as eight instances. Tremblings, palpitations, flashes of heat, chills, flushings, vertigo, nausea, vomiting, frequent urination, retention of urine, sleeplessness, thirst, free perspiration, distention of the abdomen, constitute but a partial list of the symptoms of which these women bitterly complained. Two suffered from confusion of ideas, two from great excitability, while one stated that at times she acted as if insane, so her friends told her. One suffered from frequent epistaxis following the operation, while in five painful defecation, indicating rectal involvement, was noted, in one the pain being so intense that evacuation of the bowel was avoided as much as possible. The state of the sexual sense could not be determined in the large majority of cases. In one patient sexual congress was indulged in apparently normally and without pain. However, in two others dyspareunia was described as present, being so severe in one as to absolutely interdict intercourse, while in the other it had made its appearance only following the operation. In one other case the atrophy and contraction of the vulval and vaginal parts had been so great as to prevent absolutely the introduction of the male organ, and this in a woman of but thirty years of age two years after the operation. In two others there was narrowing of the vagina noted, while in still another case there was considerable pain at the introitus in attempting the introduction of the examining finger.

Abdominal hernia was met with in two cases.

Now as regards the condition of the parts within the pelvis. The uterus itself was more or less firmly bound down in six cases, while in five others there was more or less shortening of either broad ligament, drawing the uterus to one or the other side. In eight instances exudative masses, indicating previous peritonitis with agglutination of parts, were found, and constituted a source of discomfort and pain. In sixteen instances there was pelvic sensitiveness more or less extreme; sometimes the slightest pressure by the examining finger inducing great pain. With such a condition of the internal parts as here described we can easily understand why such patients should suffer. New pathologic changes, most likely owing their origin to the operation, had replaced the original disease, giving rise to symptoms just as persistent and unbearable as those dependent upon the morbid changes for which the operation was undertaken and even more difficult of relief. Truly a deplorable issue after so much risk to life. A candid review of my cases compels the following verdict

as regards cure, benefit in each instance being given to the operation when there was doubt. Twenty-two were in no way improved, seven were partially relieved, and but two were cured. Of course, it is not claimed that such cases are fairly indicative, since they are such as have continued to suffer following the employment of the knife, and have sought other advice than that of the surgeon who operated. They but go to show, however, how many such there are, for it is hardly likely that I alone have been fortunate or unfortunate enough to meet with so many. Others must have had a like experience, and the number of such cases going from dispensary to dispensary, from hospital to hospital, and from physician to physician, without relief, it is impossible to estimate. But their number must be very considerable.

Taking Dr. Lee's results as the standard, we have 58 per cent. of cures, 27 per cent. of relief, and 15 per cent. of absolute failures among those surviving the operation. In round numbers, about one-half of all cases submitted to the knife stand a chance of ultimate complete recovery. Nor is such a result obtained rapidly. Months and even years must intervene, amidst distress and suffering, before a cure is brought about. A radical measure like extirpation of ovaries and tubes should do its work quickly; its benefits should be marked and soon apparent. But, unfortunately, experience has shown that this is not so, and even the surgeons themselves are forced to admit that their results are not obtained promptly and are not up to their expectations. The surgery which removes diseased ovaries and tubes so skilfully and with such comparative safety may indeed be brilliant, but the results are hardly worthy of such brilliancy. It is the old story of the hare and the tortoise, somewhat altered and adapted. The surgeon is the hare who quickly removes the offending organs and then slumbers, considering the race won, the cure wrought; while the cure, the tortoise, plods on slowly. He may reach the goal of recovery ultimately, or he, too, may pause by the way.

It is not claimed that surgery should never be resorted to for the relief of chronic oöphoritis. Far from it. In properly selected cases, when other measures, persistently and intelligently applied, have failed, or when we are sure of the presence of pus, it constitutes the only measure of hope for the patient.

If, therefore, medicine offers no hope, and surgery is only to be considered the court of final resort, and is to be restricted to a smaller field than it at present fills, what is there to take the place of these agencies in the combating of so comparatively common a disease as chronic oöphoritis? I unhesitatingly answer, Electricity, whether the primary or

the secondary current. He who recommends such an agent, such a force as this, in the treatment of a disease like chronic oöphoritis, is almost sure to draw down upon himself the wrath of the gods, the gods of celiotomy, who have come to claim this field as their very own. Electricity is to the gynecologic surgeon what the red rag is to the bull. You praise it before him, and his ire is aroused, and his mental horns, ever ready to strike a blow for his specialty, whether with or without reason, are lowered, and the poor champion of electricity is supposed to be thrown to the ground and mangled beyond the hope of redemption. Nevertheless, truth cannot be crushed by mere words, even by those of a celiotomist, and that electricity is of immense benefit in the management of chronic oöphoritis it shall be my pleasure to show.

(To be concluded.)

THE SPECIFIC CURE OF DIPHTHERIA BY ANTITOXIN.¹

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To Brieger we are indebted for much of our knowledge regarding bacterial ptomaines, but Behring seems to have been the leader in the recent researches regarding the feasibility of prophylaxis, immunization, and the specific cure of infectious diseases by use of the antitoxins of the blood-serum. Much of this work is comprised in his monograms upon *Blood-serum Therapy* and *Diphtheria*, respectively.

It may be of interest to inquire into the probable nature of the germicidal, antitoxic or immunizing substances which are contained in the blood-serum in association with or subsequent to the invasion of the system by certain acute infectious diseases. The Klemperer brothers, who have contributed so much on the immunization of animals against pneumonia, and have succeeded in preserving various species, absolutely refractory to this disease for long intervals, believe that the antidotal agents referred to are albumins; Halliburton and others regard them as globulins; Gamaleia characterizes them as nucleo-albumins; Victor Vaughan and McClintock, in our country, who claim to have isolated this germicidal constituent of the blood-serum, say it is a nuclein. Behring seems to incline toward its proteid nature, and states that its albuminoid character is doubtful on account of the demonstration of Ducleaux regarding the constitution of these latter substances. Loeffler, Versin, and others, also believe that the substance in many instances, as in the case of diphtheria, is a diastase or ferment, the important argument being that it is soluble in alcohol. Brieger and

Fränkel have defined the diphtheria-toxin as a toxalbumin.

The precise mode of action of the immunizing substances is still *sub judice*, but, according to Behring, they perform their function in one of the following ways:

1. By destroying the living microorganisms.
2. By inhibiting their growth.
3. By depriving them of their power to generate toxic products.
4. By destroying the poisons produced by the germs.

5. By increasing the resistance of the central organs or the cells against the poisons of the bacteria.

In regard to the source of the germicidal agents of the blood-serum produced in the course of the infectious disease, Guitéras and others believe that they are the products of the cells of the membranes, especially the serous membranes, and that they are held in suspension by the blood-serum. Hankin, in a late dissertation, proposes that these antitoxins may be a special secretion of the eosinophile granules of the blood. At any rate, we know that there remains in the system, after an attack of an infectious disease, as a result of the expenditure of the energy of the microorganisms producing the disease upon the secretions and tissue-cells, complex and as yet undetermined compounds, which protect the individual to a greater or less degree against future invasion, and which if properly extracted, may be appropriated in the treatment or cure of the corresponding disease, or in conferring immunity upon such as are susceptible.

The pneumonia-coccus produces a pneumotoxin, the presence of which in the body causes great elevation of temperature, and the subsequent elaboration from the body-cells of a substance antidotal to its action—anti-pneumotoxin. When the anti-pneumotoxin is produced in sufficient quantity to neutralize the pneumotoxin the characteristic crisis of pneumonia occurs, followed by convalescence.

Experimental injection of the pneumotoxin causes the same elevation of temperature as occurs in the natural course of the disease. The same may be said with reference to use of the toxins of tetanus, diphtheria, anthrax, cholera, typhoid fever, and other disease-germs.

In animals prostrated by pneumotoxin, or in those suffering from pneumonia of ordinary origin, the injection of the blood-serum of a convalescent animal causes a rapid subsidence of the symptoms and fall of temperature—an artificial crisis. As intimated, immunity may also be conferred upon animals by the subcutaneous or intravenous injection of this substance, as it may also be by the subcutaneous or intravenous administration of filtered bouillon-cultures of the germ which produces pneumo-

¹ Read before the Buffalo Academy, September 18, 1894.

nia—the Fränkel-Weichselbaum diplococcus or the micrococcus lanceolatus. This immunity, made complete by the use of large doses, lasts for six months, during which time it may be transmitted to the offspring.

It would appear that in the presence of an infectious disease the body-cells and fluids are capable, when properly stimulated, of counteracting the process or contributing to recovery by elaborating an antitoxin which is antitodal to the preexisting toxin. The blood-serum of animals convalescent from a disease in which toxins and antitoxins have been produced contains substances of therapeutic value. The injection of these substances in the acute stages of these diseases will modify their progress, or in some instances, as we shall see, completely stay them. In tetanus, Tizzoni and Cattani have precipitated an antitoxin from the blood of dogs, rabbits, and horses, which has proved curative in many cases reported from the Innsbruck Surgical Clinic. The last report from the Pasteur Institute in Paris shows a mortality of less than one-fourth of one per cent. in rabies by the use of a substance which Pasteur extracts from the spinal cord of animals inoculated with this disease, and attenuates by drying. We have here a specific, as now conceded by all scientists, and practically an absolute cure.

But it was more especially with reference to diphtheria that I was to address my remarks upon *Serum-therapy*.

The bacillus of diphtheria was discovered by Klebs in 1883, and was obtained in pure culture and its pathogenesis demonstrated by Loeffler in 1884. I will not go into the morphology of the organism further than to direct your attention to the cultures in different media which I present for inspection. I have also stained preparations of the germ under microscopes. A peculiarity which is worthy of notice is the great irregularities in form, which exist commonly in the same culture-medium, but more especially in unfavorable media. The organism takes the Loeffler methylene-blue stain best. For sections, the modified Weigert double fibrin stain of picrocarmin is most effectual. This germ has no spore and is facultative anaerobic, but thrives best in presence of oxygen. The most favorable culture-medium for it is blood-serum with bouillon containing one per cent. each of peptone and grape-sugar. Upon potato the growth of the diphtheria-bacillus is entirely invisible or indicated only by a delicate glaze after the lapse of a number of days. Milk, even at a comparatively low temperature, 20° C., is a favorable medium for the growth of this organism, and we may infer that the latter fluid can act as the source of transmission of diphtheria.

The diphtheria-bacillus, unlike the typhoid and

cholera bacteria, resists dryness for months, and it may be found in the throat and be capable of conveying diphtheria for three weeks after the onset of an attack of this disease. It is a very recently revealed fact that individuals may have this germ in their mouths and convey it to others, infecting them with diphtheria, without having the disease themselves. It was shown in discussion upon the subject at the recent Congress of American Physicians in Washington that contamination of the air by sewer-gas is very potent in the occurrence of individual cases and the dissemination of diphtheria.

The thermal death-point of this bacillus is 58° C. In the vast majority of instances (it has been said always), the bacilli are only found at the point of inoculation, and the symptoms are often serious consequences; the paralyses, etc., are due to the absorption of the ptomaine product which is one of the most deadly poisons that we know in either the mineral or vegetable kingdom. Recently a case has been observed in which the Klebs-Loeffler bacillus of diphtheria was found in the blood and in the viscera after death. The case was one of malignant type and occurred in a child in which the membrane had extended to the bronchi. The patient had been tracheotomized.

One-eighth of a cubic centimeter of an old alkaline bouillon-culture which has taken on greatly increased virulence will suffice to destroy a guinea-pig in a short time, when injected subcutaneously. The toxic potency of the diphtheria-ptomaine is reduced by low temperatures and completely destroyed by boiling. This toxin may be precipitated from pure cultures by alcohol. It appears as a whitish substance soluble in water. One to two decigrams will destroy rabbits. The deadly poison causes local edema and necrosis.

More than a year ago, Briege and Fränkel succeeded in rendering guinea-pigs immune to virulent cultures of the diphtheria-bacillus by attenuating the virus through age and exposure to heat. From sixty to seventy degrees was the temperature used, and this may be said to be the first reliable means to obtain immunity in animals to diphtheria. Later, a number of methods were employed, as the addition to the virulent cultures of chemical agents, such as iodin trichlorid, the virus being attenuated; and the use of the metabolites produced by the bacilli in the living organism, the animals to be immunized being treated with the juices from diphtheria-diseased animals.

A fourth method consisted in inoculating animals with the active virus and then counteracting the effect by therapeutic agents. The most reliable of the foregoing methods was the use of iodin trichlorid, but good results were obtained in a similar way by the employment of chlorid of gold and

sodium. Behring immunized guinea-pigs and rabbits by a preliminary course of treatment with hydrogen dioxide. A very effectual means of immunization is by injection of the attenuated toxin, and then gradually increasing doses of the non-modified toxin or pure cultures of the bacillus. Animals may thus be rendered highly refractory to tetanus as well as diphtheria.

It will be seen from the foregoing various methods that the keynote to immunity is the attenuation of the virus. The results are dependent, first, upon the occurrence of a reaction unlike that which follows the use of tuberculin, and, secondly, upon the absolute quantity of toxin employed. In entire absence of reaction no immunity follows, and the latter is more pronounced, the more severe, the more protracted the reaction. Behring rendered forty sheep refractory to diphtheria by successfully inoculating them with increasing doses of attenuated virus, until no elevation of temperature followed. Virulent living cultures or toxic media then introduced into the animals produced no effect. The immunity is the result of the development in the blood of an antitoxin which has the power of neutralizing the diphtheric virus. This blood may be withdrawn and utilized as a therapeutic agent in the prevention and cure of cases of diphtheria. An immunized sheep will, when 50 cc. of its serum are withdrawn every month, furnish two liters and a half per year, which, according to Behring's calculations, will suffice to immunize 5000 children or cure 200 when applied shortly after infection.

The duration of the immunity is in direct relation to the quantity of serum injected, and as stated with reference to pneumonia, the condition is transmitted from parent to offspring. The chemic composition of the diphtheric antitoxin, like similar products of the germs of other infectious diseases which have been isolated, is still not clearly understood, but its ability to prevent and remove the effects of the living bacilli in the organism is demonstrated by a large amount of animal-experimentation. The addition of 5 per cent. carbolic acid serves well for preserving the curative substance contained in blood-serum. It being an organic substance, it would naturally tend to decompose. The serum, which is the essential medium of the curative substance, is separated from the blood by coagulation.

As already stated a much less quantity is required to immunize than to cure an animal. This disproportion is vastly less marked, however, in the case of diphtheria than in tetanus, in which from one-thousand to one-million times more serum are required to effect a cure than to produce immunity. Intra-peritoneal is a more effectual means than subcutaneous administration, but harmless. For guinea-pigs the ratio of the curative serum required is to

the body-weight as 1:1000, when treatment is begun immediately after infection, and 1:400 after the appearance of distinct symptoms. According to this rule a child weighing 20 kilos would require 50 c.c. of the serum at the beginning of the disease. The protective substance contained in the diphtheric serum is an absolute specific, *i. e.*, its action is confined exclusively to the diphtheria-germs and their products; it has no effect whatever upon other organisms, and does not influence the body either favorably or unfavorably when diphtheria is not present. Therefore the remedy stands unique among our therapeutic agents, and while capable of great good in the sphere of its usefulness it is harmless outside of this scope. It counteracts the diphtheric process effectively, and even if applied in an amount one-thousand times greater than necessary to produce the desired action it would simply offer a more safe protection or cure as the case might be. But such reckless extravagance in its use is not likely to be practised, for we shall see that the production of a sufficient quantity of this valuable agent is, for the present at least, going to be our chief difficulty. In fact the remedy is not available at all in our own country at the present time.

I have stated that the action of the protective substance in the blood-serum was confined exclusively to the diphtheria-bacillus and its products. We can, therefore, not reasonably expect to relieve to any great extent or cure cases of mixed infection. Such is the type often assumed in diphtheria after several days, and this undoubtedly accounts for the reported failures attending the use of the curative serum in certain cases. In one instance no diphtheria-bacilli could be found post-mortem at all, but only streptococci. In another patient that had been tracheotomized the diphtheria-bacilli were found in the blood and visceral organs, and the child had been sick three days before being admitted to the hospital. This was a case of the malignant type referred to.

We must make an exception for septic cases of diphtheria. I mean cases in which the sepsis is due to germs other than the Klebs-Loeffler bacillus; against such germs or their products the antitoxin of diphtheria is powerless. It is not a cure-all, as Behring states. Septicemia or secondary infection complicating diphtheria may be effectively treated by potassium chlorate or iodoform.

The experiments of Aronson in isolating the protective substance of diphtheria from the blood-serum may be briefly recorded. He succeeded by his particular method in concentrating the curative material contained in 10 grams of the serum into 8 grams of solid powder. This dry substance produced one-hundred times the effect of the serum. It is white, soluble in water, but more soluble in

dilute alcoholic solutions, which furnish all the reactions of the proteins. Dried in *vacuo* at 40° C., the substance may be heated to 102° or 103° C. without losing its active properties. The body does not possess chemotaxis. From ten to one-hundred-fold the immunizing dose of this substance is sufficient for a cure; the possibilities for successful therapy therefore are much greater than in the case of tetanus, in which the dose to cure an animal amounts to from 1000 to 1,000,000 times that necessary to immunize it. The serum which was used in the treatment of the first cases of diphtheria in Berlin was obtained by Behring from highly immunized sheep. Injections were made preferably into the anterior wall of the chest, in the back, or extremities, with a 10 c.c. Koch syringe. The dose administered at one time varies from 5 to 20 grams, according to the severity of the illness. One-thousand-and-eighty-one cases of diphtheria treated in the Kaiser-Friedrich Children's Hospital in Berlin since its establishment, by the ordinary methods of treatment heretofore in vogue, gave a mortality-rate of 38.9 per cent. Some statistics furnish 50 per cent. as the average mortality of true diphtheria in children. One series of thirty-two cases is on record from one of the Berlin clinics, in which only eleven of the patients survived the disease, a mortality rate of 65.6 per cent. The treatment of diphtheria by use of the specific antitoxin has recently been carried on quite extensively in the various clinics of Berlin. Of seventy-two cases treated on the first two days of the disease by the antitoxin all but two recovered. Statistics of this same clinic regarding the treatment of seventy-two cases by methods previously employed, showed that twenty-five patients had died—accordingly a mortality of 34.7 per cent. One-hundred-and-twenty-eight cases treated by antitoxin in various stages of the disease at the Kaiser Friedrich Hospital gave a mortality-rate of 13.2 per cent. It has been stated that the remedy must be used very early to prove curative. It has no injurious effects upon the heart or kidneys, nor upon the system in any way, as shown by observation of one-hundred-and-twenty-eight cases treated by Dr. Katz.

Out of more than 250 cases treated in this way at different stages of the disease 100 per cent. recovered when the inoculations were made within the first twenty-four hours; when made on the second day 97 per cent. recovered; on the third day, 87 per cent.; on the fourth day, 76 per cent.; on the fifth day, 57 per cent. By use of the antitoxin the development of diphtheria may be prevented in persons that have been exposed to the disease, and immunity conferred upon them, so that they can go among epidemics with impunity. If cases can be seen, then, and recognized as diphtheria in the first twenty-

four, thirty-six, or even forty-eight hours, we have in the use of the antitoxin practically a specific, and the mortality-rate in this dreadful disease can be reduced almost to a minimum. After the first day or two the value of the method grows progressively less. We have in this the imperative necessity for the recognition of the disease very early if we will make use of the curative serum soon to be placed at our disposal, and thus restrict the ravages of diphtheria. How can this early recognition best be promoted and made certain in large municipalities? Simply by aid of our municipal health-authorities, as has been done in the city of New York, which now stands out as an example to the whole world. This disease is essentially, and for a long time has been, under the supervision of our municipal health-authorities, but the supervision must now be extended to the aid of individual physicians in immediate proof of whether a suspected case is or is not one of diphtheria. The evidence referred to can readily be afforded by an examination of the deposit in the throat for the Klebs-Loeffler bacillus. This is our only *absolute* means of diagnosis in the very early stages of the disease, when recognition for therapeutic reasons is now very important.

Such bacteriologic examination for this bacillus cannot be made by practising physicians, nor will circumstances always permit of having the examination made privately. But if the health-departments of our cities will take the matter up (and this should interest them as the most available means of preventing epidemic extension of diphtheria) and furnish physicians with the bacteriologic proof as soon as possible after a case has been reported, then this heretofore dreaded malady can be made as harmless as almost any disease with which we have to deal. The way in which the work is conducted by the Health-Department of New York is briefly as follows: In that city there are forty stations, mostly drug-stores, at which physicians can obtain culture-outfits, so-called, which consist of small wooden boxes, five inches long, two inches wide, and half an inch thick. These boxes contain two thick test-tubes, in one of which is placed a wire wrapped at one end with a small peldorf of cotton. This serves as a swab. The other tube contains a small quantity of culture-media, the composition of which has been described (Loeffler's diphtheric blood-serum.)

When a physician has a case of suspected diphtheria he obtains one of these outfits from the station in his vicinity. They are placed at his disposal, free of charge, by the Health Department. The swab is passed gently over the membrane in the throat by the physician in charge, and then conveyed to the tube containing the medium for inoculation.

The tube is enclosed in the box, wrapped in

cotton, and sent to the Department of Bacteriology, or is taken up by the collectors who go to the stations every day. At the laboratory the necessary bacteriologic examination is made, and in from twelve to fourteen hours the physician is mailed a report of the character of the case, or he may receive it at noon the day following by telephone. He knows then whether the patient is suffering from *true* or *false* diphtheria. The culture-test and microscopic examination of stained slides easily decide the question. It has been estimated that 95 per cent. of physicians having cases of diphtheria have made use of this method. Of 5611 cases examined in New York in twelve months 3255, or 58 per cent. only, were *true* diphtheria, and 1540, or 27 per cent., were false forms of the disease.

With the cure for diphtheria which we have now at hand, the importance of this system in cities for the early recognition of this disease cannot be too highly praised, for it has been stated that it is essentially upon the early application of the antitoxin that the success of the agent depends. Even Koch himself has commended the system inaugurated for the examination and control of cases of diphtheria by Dr. Biggs, in New York, and the Congress of British Hygienists, which recently met in London, lauded it, and made arrangements for its adoption in many of the cities of England, after the instructions and account given them by Dr. Biggs, who was present at the Congress.

From thirty to fifty per cent. of the cases taken to the Willard Parker Hospital, in New York, as *true* diphtheria were shown by bacteriologic examination to be *pseudo-diphtheria*, a disease which has a mortality of only about 2 per cent., is non-infectious, and does not require isolation or disinfection. It can readily be seen that it is an enormous saving to the Department of Health to have the cases rightly diagnosed at the start. This saving much more than counterbalances the expense of the bacteriologic investigation.

To return to the treatment of diphtheria by the antitoxin; it will be some time before the remedy can be produced in sufficient quantity to be available for us. Large animals, such as the sheep and cow, first have to be immunized by being put through a course of treatment which requires from four to six months. Their blood can then be drawn in moderate quantities at regular intervals, without affecting them unpleasantly, and this, representing the antitoxin, is used for the treatment of cases of diphtheria. It requires skilled bacteriologists to immunize the animals, and then it would be well to have had a special course in the Koch Institute for Infectious Diseases. The remedy will necessarily be somewhat expensive, on account of the long time required for its production, the special methods

demanded, and the skill on the part of the operator. It has been stated that the antitoxin will cost at the rate of a dollar a dose, although I believe this is placing it rather too high. However, its use for the treatment of poor people in large cities will only be possible when the agent can be provided by the health-authorities. In immunizing animals the quantity of diphtheria-cultures injected is sufficient to kill about 500 animals of the same kind.

The protective substance is contained in the milk as well as in the blood-serum of goats and sheep which are immunized. Goats have been found to be especially well adapted to the immunizing experiments, by reason of their susceptibility to diphtheria and the exceptional retention of the high degrees of immunity which experience has shown it possible to produce in them. The toxins of diphtheria and the antitoxin neutralize one another outside of the body as well as in the test-tube, as shown by the observations of Behring and Kitasato. The quantities of antitoxin contained in the milk of goats, sheep, and cows is far less than that found in the blood of these animals when immunized, although this milk when used in cases of diphtheria will decidedly modify the diphtheric process. Products of a cow which Kossel recently immunized in the Veterinary Institute at Berlin were used successfully in the cure of diphtheric children. Even though the specific action of the antitoxin is most marked in the very early stages of diphtheria, it modifies noticeably the character and severity of the disease in its more advanced stages, and lowers the mortality-rate. Wounds after tracheotomy heal favorably as a rule, and grave cases of laryngeal diphtheria have been cured. Almost always after an injection of the remedy the temperature promptly falls, the pulse is lowered in frequency and improves in volume; the character of the respirations is improved also. The indications for a repetition of the dose are the course of the temperature and pulse and the local appearances. I believe erroneous impressions may have arisen from the reports already issued on account of the lack of proper discrimination as to the character of the cases and the time in which the remedy was used. It has been shown that diphtheria often has septic complications from the very start. We cannot expect that these cases can be cured by the antitoxin, which is a *specific*. In some of the 220 cases reported by Ehrlich, Kossel, and Wassermann, the possibility of recovery was almost precluded by reason of the advancement of the disease. Necropsy showed extension of the exudate far into the smaller bronchi in some cases, and multiple hepaticized areas in the lungs, induced by streptococci and a streptococcus infection of the blood.

In other cases which they treated they did not

have enough of the serum to make a showing which did justice to the remedy. In still other instances the fatal termination ensued from complications like nephritis and pneumonia. Thirty were patients that had been tracheotomized. Of sixteen that had been tracheotomized in one hospital in Berlin only four died after the use of this remedy. In twenty-six other cases treated in this, the Elizabeth Hospital, the course was most favorable in every instance, notwithstanding many unfavorable prognoses having been made from the beginning. In a large number of the 220 cases treated recovery without the use of such a remedy as this seemed almost impossible. Other patients could have been saved if sufficient serum had been obtainable to give several doses. It is thought that the frequent occurrence of paralysis may be lessened or prevented by the early employment of the antitoxin. Ehrlich, Kossel, and Wassermann say that of their serum 100 units should be used, and that in severe and tracheotomized cases 400 units should be administered. The treatment is repeated on the same day or on the day following, according to the character of the symptoms. From four hundred to 1000 or 1500 units may be administered in all. No results correspondingly favorable have ever been obtained in the treatment of diphtheria, notwithstanding the use of this remedy in many cases in the late stages. In the early stages experimental and clinical evidence shows the antitoxin to be curative.

It may be of interest to give some further account of the physical properties of the diphtheric antitoxic serum as *latest* produced. It is a clear, colorless liquid, thick in consistency, quite viscid, and has what is described as a "carbolic" odor. A proportion of 0.2 per cent. trikresol is efficient in preserving its organic composition, as well as the carbolic acid previously referred to. Two firms in Berlin are at present producing antitoxin. The one product is the "Behring-Ehrlich Heilserum" and the other is Aronson's. The two remedies vary only in strength, and are both effectual.

Of the former there are also two preparations. No. II is two-and-a-half times stronger than No. I. The latter is used in mild cases in children under ten years of age. A high degree of immunization of animals is necessary for the production of the stronger serum; therefore a constant supply cannot be guaranteed at present. This remedy is a very effectual curative agent in severe cases of diphtheria at any age, and the dose is 1.15 cc., which represents about 150 antitoxin-normals. The dose of Behring and Ehrlich's form No. I is 1 cc., which is equal to 60 antitoxin-normals.

Gentle massage is always advisable after a hypodermatic injection, and this is practised when antitoxin is introduced hypodermatically. Abscess-

formation resulted only once in two hundred injections made at the Kaiser and Kaiserin Friedrich Hospital, Berlin. The usual dose which Aronson administered is from 5 to 10 cc. Ten cc. may be given in a very severe case. Here, as always in making hypodermatic injections, the syringe should first be sterilized, and this is best done by submerging it for five (5) minutes in and injecting through it boiling water. An erythematous eruption sometimes appears after antitoxin treatment, which subsides after a few days. Patients with laryngeal stenosis often rapidly recover, and malignant cases begin promptly to improve after an injection. For maintaining immunity by antitoxin, injections had better be repeated after three or four months. Ten cc. or 60 of Behring's antitoxin-normals suffice for immunity or for prophylaxis. Fifty cc. may be given, and if repeated do no harm. Aronson's serum, made at Schering's factory in Berlin, is twice as strong as other products which he has tried. Five grams of Aronson's serum are equivalent to 500 grains of that which was originally used by him. Dr. Louis Fischer, of New York, who has just returned after a course of study with Prof. Baginsky and Dr. Aronson in Berlin, has treated with antitoxin one child that was suffering from diphtheria, which is I believe the first case reported in which the antitoxin has been used in this country. The diagnosis of diphtheria was demonstrated bacteriologically (which is the only *absolute* method) and the symptoms of the disease were pronounced. Five cc. of Aronson's serum were administered, and the next day a marked improvement was noticeable. On the third day the greenish membrane had entirely disappeared. On the fourth day no symptoms of the disease remained, and on the sixth day the child was entirely well. A transitory albuminuria disappeared under the treatment.

Recently Dr. Katz, of Berlin, inoculated with antitoxin 72 children that had been exposed to diphtheria, and only eight of these developed the disease. The latter cases were of very mild form. Of 130 children inoculated by Dr. Aronson in families in which diphtheria had occurred, only eight cases developed. Dr. Behring states that even at the present time the mortality of diphtheria under treatment by antitoxin may be safely placed at 5 per cent. As regards dosage and age, further, the following rule may be formulated: Under two years, during the first two or three days, 2 to 3 cc. are given; from two to ten years of age, 5 cc. are administered; over ten years of age, 10 cc. Aside from its marked curative effect this is an ideal method of treatment as regards simplicity; the troublesome spraying and swabbing of the diphtheric patient's throat, which are not unattended with danger, and the frequent internal administration of drugs are dispensed with.

On the theory that the change from toxin to antitoxin is a chemic one, Surinow has attempted to produce properties in the serum of diseased animals similar to those possessed by the blood of animals which are immunized. Electrolysis was used for the purpose. By oxidation or reduction there resulted the production of antitoxin, and the same effect followed the application of electrolysis to diphtheric bouillon-cultures. Some successful experiments are recorded from the use of antitoxins thus produced. If this method proves reliable it will greatly simplify our means of obtaining the valued antitoxin, which is now expensive on account of the great length of time required to immunize animals.

The French have not been slow to profit by the researches of their German brethren. M. Roux reports 448 cases of diphtheria in children treated by the new method at the Hôpital des Enfants Malades in Paris during a period of six months ending July 28, 1894. The improvement in the death-rate attributable to treatment with the new remedy was over 27 per cent.

We have every reason to believe that diphtheria will now be made a harmless disease, and that in the blood-serum of immune animals we have a more simple and reliable means for the vaccination of children against diphtheria than is offered even by vaccine-virus for the prevention of smallpox.

NERVOUS AND MENTAL SYMPTOMS OF LATENT AND INTERMITTENT NEPHRITIS WITHOUT ALBUMINURIA.¹

By LUDWIG BREMER, M.D.,
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FOR years I have in my neurologic and psychiatric practice met with cases presenting localized or general troubles, whose origin and nature seemed to be obscure, and whose connection with renal lesions became apparent on examination of the urine, although the albuminuria, generally considered essential, was absent. A typical example may stand for quite a number of cases that have come under my observation in the course of years.

Several years ago I was called upon to examine into the mental condition of a gentleman past sixty, who had rather suddenly developed symptoms of mental aberration. After a few days of indefinite malaise he astonished his family by the assertion that he had seen a negro climb up a tree that stands in front of his house and peep through the window into his room. There were other statements of a similar absurd character, which he made with the

positiveness of matters of fact. When I saw him, he conversed fluently and, as it seemed, rationally on ordinary everyday topics, but I found that he had lost his bearings as to time and space. Although in his own sleeping-room, he had a vague notion that he was away from home, and, to the great alarm of his family, he was uncertain about the season of the year, not to speak of the day of the week or the time of the day, of which he had completely lost all track.

Remembering several cases of nephritis in which the same mental phenomena had presented themselves, I made, after excluding alcoholism, a preliminary diagnosis of uremic intoxication. That this loss of the conception of time and space is a common symptom in alcoholic insanity, especially in some forms of alcoholic imbecility is, I think, a fact well known by all psychiatrists of average experience.¹

The urine was found to contain no albumin; its specific gravity was 1026; its color dark-brown; hyaline and granular casts were present in moderate amount. The man had had two attacks of Asiatic cholera—one in 1849, the other in 1866, which left him in an enfeebled condition from which he had never recovered. A diagnosis of chronic parenchymatous nephritis had been made by a physician in Germany, while the patient was in that country in search of health, ten years previously. Since then he seemed to have gotten along so well that this diagnosis had been forgotten by the family until revived by me.

The patient recovered completely, and although he has had several slight relapses, manifesting themselves chiefly as lumbago, great lassitude, sleeplessness, and intestinal disturbances, he is now practically well. I have no doubt that the disease dates back at least twenty-eight years—i. e., to his second attack of cholera.

I gave a favorable prognosis, based on the outcome of a case that I had seen in consultation several years before, and in which, relying too much on what the microscope had taught me, I had given a very unfavorable opinion as to the outlook for the patient's life.

In this case there had been, after a few days of ailing, and a spasticity in the calves of the legs (a not unusual premonitory symptom of uremia), a

¹ The mild uremic delirium bears a close resemblance to the chronic alcoholic variety. There is the same blandness and suavity of manner, the quiet, rational conversation, which misleads the patient's friends, who pay him a flying visit, into the belief and assertion that there is nothing the matter with his mind. The whole picture, however, is changed as soon as the patient, in the midst of rational talk, makes the assertion, for instance, that he saw Mr. X. down town yesterday, when, as a matter of fact, he has been at his house for a month, or when he avers that to-morrow he will start for home.

¹ Read before the Missouri State Medical Association, May 16, 1894, at Lebanon, Mo.

fainting-spell, from which the patient awoke in a dazed condition. For two weeks the man did not recognize his friends or his surroundings. Apoplexy had been thought of by the attending physician. The presence of albumin in the urine had not been detected during the whole course of the disease; the amount of urine was about two-thirds of the normal, whilst the quantity of urea excreted during the twenty-four hours was fully up to the standard. There were present cylindroids, hyaline, granular, and epithelial casts, many leukocytes, and a varying amount of uric acid. There was no history of renal or vascular disturbance, and no dropsy.

In spite of my evil prognosis, this man recovered completely, and is to-day in possession of all his mental and physical faculties, although for months a slow and deliberative manner of speech and a sluggishness of the thinking-process was noticeable. Great and prolonged mental strain, the abuse of whiskey, and excessive card-playing at night were probably the exciting causes of this attack.

I have encountered the same microscopic findings, often including numerous leukocytes, the absence of albumin, dropsy and vascular disturbance, often a high specific gravity of the urine (up to 1030 and more) in quite a number of cases, presenting the most heterogeneous symptoms, and, at first sight, suggesting absolutely no renal affection. Edema was present in only one.

I will cite the case of a lady who, after a short period of catarrh of the trachea and bronchi and stomach, accompanied by intense headache, became suddenly partially aphasic. She was not only unable to give utterance to her thoughts, but she could not catch the meaning of what was said to her. There were illusions, hallucinations, as well as megalopsia, everything appearing to her unnaturally large. She has now recovered her mental faculties. Several days ago, almost a year after her aphasic attack, I examined her urine again. Instead of presenting a high specific gravity, casts and leukocytes, and an absence of albumin, I found a low specific gravity (1014), no casts, but the presence of albumin, a complete change from the former finding, with the disease no doubt still persisting. An attack of influenza occurring several years previously was probably the cause of the nephritis.

The same infection seemed to be at the bottom of what appeared like an obscure neurosis in a child of two-and-a-half years old. This patient had an attack of influenza when six months old. After an interval of over a year of apparent good health some gastric symptoms developed; at the same time she began to lose the use of her legs, which were extremely sensitive to touch. She could lie only in one position, on the right side, with the legs slightly adducted. Very large quantities of uric

acid and almost every variety of casts, excepting blood and waxy casts were found in the urine, but no albumin. This is the only case of this class under my observation in which edema appeared. No marked improvement had taken place after three months of treatment.

Sometimes a trauma is responsible for the renal disease. I have seen a case of rapidly-developing tabes accompanied by parenchymatous nephritis following a fall from the second story on the nates. The patient died from the degenerative process of the posterior tracts spreading rapidly to the medulla oblongata. There were, post-mortem, the characteristic lesions of the posterior spinal tracts in connection with acute parenchymatous nephritis. In this case only slight traces of albumin could be demonstrated in the urine.

On the other hand, albumin was absent in another case that I saw in consultation a few weeks ago, in which mental dulness, hesitancy of speech, and general confusion were the predominant symptoms. The patient is forty-five years of age. When he recovered his senses he remembered that he had slipped whilst stepping on a banana-peel about a week before the head-symptoms set in, and that with a tremendous effort, and by going through a number of complicated movements, he succeeded in maintaining his equilibrium. A friend, who witnessed the occurrence, expressed his fears at the time that such an unnatural effort was bound to be followed by evil consequences. In this case the disease existed probably in a dormant state before the accident. The man was apparently healthy all his life.

I have seen two cases in which recovery took place that mimicked typhoid fever, with brown tongue, slow pulse, and great somnolence, apathy and mental obtundity. The non-existence of an epidemic of typhoid fever at the time constitutes negative evidence, while the presence of casts in the urine establishes the diagnosis.

Numbness of the hands and fingers, indisposition to work, a sense of pressure in the head, slow pulse, below 60, catarrhal conditions of the respiratory or digestive tract, rheumatic pains, neurasthenic symptoms, melancholia, and mania may be the clinical manifestations of nephritis.

In one case, in a woman of fifty, whose urine presented the characteristics already detailed, a facial neuralgia of a severe type, and lasting with slight intermissions and remissions for months, disappeared suddenly on the supervention of a maniacal attack. When this ceased, after a duration of two days, the neuralgia reappeared. At one epoch of the disease the neuralgia would alternate with attacks of profuse diarrhea, the diarrhea probably carrying off the toxic substances causing the neuralgia.

In quite a number of cases of the kind under

consideration I found rudimentary indications of the symptoms, such as impairment of the conception of time and space, sometimes coupled with a feeling of tension in all the muscles. This muscular spasticity is, I believe, one of the earliest symptoms of uremia. I have seen it in several cases of hydro-nephrosis due to stricture, prostatic enlargement and distention of the seminal vesicles. Such patients complain of impairment of memory and confusion of dates. Events that took place years ago appear as of recent date.

The prognosis in all of these cases of parenchymatous nephritis is not unfavorable. Quite the reverse, of course, obtains in cases of contracted kidney. Here, as a rule, the vascular and urinary symptoms are plain and readily made out. But in this form of nephritis latency or intermittence may deceive even the best diagnostician. The peculiar features of heart and pulse may be absent. Among a number of cases that have come under my observation I shall cite only one, a rather celebrated case in St. Louis insurance-circles. It was that of a physician, who, while riding in his buggy after nightfall, was, under mysterious circumstances, struck in the head by two small bullets. An operation for the extraction of the missiles, which had not penetrated the skull, was performed under chloroform, but the man died a couple of days later. Suicide by shooting and arsenical poisoning was talked of. The man had carried life-insurance of \$80,000—much beyond his means—and most of the policies had been but recently issued. The kidneys were in an advanced state of chronic interstitial inflammation, with an enormous number of glomeruli obliterated. There were also a great many collapsed uriniferous tubules with thickened walls, characteristic of secondary shrinking in the course of chronic parenchymatous nephritis. The kidneys were a little smaller in size than normal.

The man had been strange and peculiar in his manner and actions for a year and more, and had been running from one insurance-office to another. The remarkable feature about his insurance-mania was that the beneficiary was a person (his wife) whom he detested. My conclusion was that this specimen of an insurance-crank suffered from uremic insanity (melancholia) when he applied so assiduously and extensively for insurance; that he had then a cirrhotic kidney, and that, being a nephritic, he died from the effects of the chloroform. The companies had to pay. He had passed the examinations of all the physicians. One, a diagnostician of great ability, found his urine normal, but advised the company against accepting him, on account of his mental symptoms. In spite of this they issued a policy of \$10,000.

That arterio-capillary nephritis in an advanced

state may exist in apparently strong and healthy men, in a latent state, occasioning no symptoms, until by hardship and exposure during a hunting or a fishing trip, for instance, the slumbering inflammatory process is relit and leads to a rapidly fatal result, was recently demonstrated by the death (from cirrhosis of the kidney) of the wealthiest man in this part of the country, who was of athletic muscular development and apparently in the best of health a short time before his death.

I cannot say anything special or new on the treatment of the class of cases considered in the foregoing remarks. It is, however, worthy of mention that elaterium or elaterin given so as to produce watery stools, alternated with mercurial mass, has generally the effect of clearing up the sensorium of nephritic patients presenting mental symptoms. The rest of the treatment is that generally adopted by the profession. Dr. Stewart¹ relates that he has given thyroid extract with good effect. I think this agent worth trying, and am at present employing it in a case in point, apparently with benefit. I doubt, however, if experience warrants the creation of a third form of chronic (non-albuminous) nephritis closely resembling neither the parenchymatous nor the interstitial variety. It is improbable that an anatomic substratum of a definite character and distinct from the two recognized varieties is underlying the cases here treated of. It is well-known that in some cases it is very difficult, if not impossible, to make an anatomic diagnosis in a case of chronically inflamed kidney, the epithelial and connective-tissue elements being equally involved, or nearly so. Again, the clinical symptoms may change from those of one form to those of another (generally from those attending the chronic parenchymatous to those of the cirrhotic kidney), as was observed in the case related in which aphasic symptoms appeared. Probably we have to look for conditions similar to those found in the kidneys of the physician referred to. A plausible explanation of the absence of albumin does not exist.

The presence of the normal amount of urea in the cases presenting uremic symptoms points to a cause other than the retention of urea. Brown-Séquard's theory of an internal renal secretion whose admixture with the blood is as necessary as is that of the thyroid gland to the healthy function of the nervous system seems not impossible.

The most remarkable feature about the uremic disturbances are their localizing tendencies, attacking either the brain and the special convolutions of that organ (aphasia, localized paralysis) or the spinal cord, a peripheral nerve, etc. This, however, is

¹ "Further Remarks on the Occurrence of a Form of Non-albuminous Nephritis other than Typical Fibroid Kidney." THE MEDICAL NEWS, April 14, 1894.

not without analogy in toxic diseases (poisoning by lead, mercury, strychnine, etc.).

I have encountered three cases of a third form of non-albuminuric nephritis, alternating with diabetes and likewise producing a variety of incongruous and inexplicable nervous and mental phenomena, localized or general, and similar to those already described. The pathology of this condition is still more difficult of comprehension than is that of the cases alluded to. The cases linger for years, have many ups and downs, and, as far as I know, never recover.

CLINICAL MEMORANDA.

ACCOUCHEMENT FORCÉ: REPORT OF A CASE.

BY JOHN G. CECIL, B.S., M.D.,
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LOUISVILLE, KY.

ON the morning of April 2, 1894, I was called by Dr. Atwood Smith to see a patient in consultation. Arriving about 9.30 A.M., I obtained the following history: Mrs. T., aged twenty-two, the wife of a policeman, had been left by her husband about 10 P.M., April 1st, in her usual health, that is, not complaining more than she had been for the preceding two or three weeks. For several weeks her feet and legs had been swollen; she had not suffered or complained of headaches, disturbances of digestion, or vision; there was not much swelling about the face or hands.

Her husband returning from his watch at seven o'clock on the morning of the 2d, knocked, but receiving no response finally forced the door, and found his wife undressed and in bed entirely unconscious. Not being able to arouse her, he at once sent for Dr. Smith. The Doctor sent for counsel, and during the intervening time observed her in three or four convulsions. He at once commenced the administration of chloroform by inhalation during and at intervals between the convulsions, and gave drop-doses of croton-oil in emulsion. Upon examination I found her in labored respiration—about twenty to the minute—the pulse 72, full, round, and hard; the temperature normal, the eyes staring, at times partially closed, the pupils not responsive to light; the feet and legs considerably swollen, some puffiness about the eyelids, restless, rolling from side to side and tossing her limbs about. She had been vomiting and purging. Digital examination revealed the vagina soft and dilatable, covered with abundant secretion, the cervix shortened but firm, the os admitting the examining finger.

She was within six weeks of the expected completion of her term of gestation, and from the periodic restlessness we thought it probable that she was having labor-pains, though little impression was being made on the cervix. The bag of waters was unbroken, and the presenting head could be felt, but it was not engaged. Fetal heart-sounds were heard in both hypochondriac regions, but more distinctly on the left. The uterus was large and irregular in outline.

The diagnosis of multiple pregnancy, owing to the urgency of the condition, was not made out at this time, as it undoubtedly might have been easily done had more

care been bestowed upon it. In consultation we determined to control the convulsions with chloroform; to prevent recurrence by hourly doses of fifteen grains of chloral hydrate by the mouth, or thirty grains by the rectum; to continue efforts at purgation by the croton-oil, and to let the labor for the time take care of itself. During the next four hours she received six drops of croton-oil, which did not produce purgation until five or six hours later; also one hundred and twenty grains of chloral per rectum. Notwithstanding this and the administration of chloroform, she had two violent convulsions, the last one being especially severe.

I saw her again at 1.30 P.M., and, Dr. Smith concurring, determined to deliver as rapidly as possible. Accordingly, she was placed in position, a vaginal douche given, put completely under the influence of chloroform, the urine drawn (which proved to be heavily laden with albumin), and cervical dilatation was begun with the fingers. Proceeding slowly, half of the hand, thoroughly cleansed and well oiled, was introduced into the vagina, and one finger into the os externum. In a few minutes a second finger was squeezed in alongside of the first. Then, at short intervals, the third and fourth fingers were inserted, and the four fingers, bunched into a cone, were used as the dilating wedge. The fingers were pushed as high as the presenting part would allow, care being taken not to rupture the amniotic sac; they were then made to oppose each other, the index and sometimes the middle finger being hooked into the cervical ring, pulling it gently in different directions, the other fingers opposing. The cervical ring was thick and strong, and offered not a little resistance. The manipulations were continued for about forty minutes, when I had secured considerable thinning out of the cervix and a dilatation of from one-and-one-half to one-and-three-quarter inches. The head was now engaging, and the waters unbroken. I now had the choice between version (which might not have been an easy undertaking in view of the subsequent discovery of twins) and an effort to apply the forceps. Knowing the dangers incident to the delivery of a living child by the breech in a primipara under the most favorable surroundings, I determined to make an effort to apply the forceps; in the event of failure, I still had the alternative of version. Accordingly, the bag of waters was ruptured, and a small head in the right occipito-posterior position became partially engaged at the superior straight. The forceps was adjusted with some difficulty, the cervix being tightly stretched like a rubber band around the blades when they were locked. I now felt that I had control of the situation, and even though a laceration of the cervix should occur, I would be justified in bringing the labor to a speedy termination. Intermittent tractions at intervals of two minutes were made very gently, and I soon had the satisfaction of seeing the cervical fibers dilate and retract over the forceps-blades and the descending head. The delivery was soon accomplished. The head being very small and the pelvis roomy, the former never rotated, but was delivered with the face looking to the symphysis. The child, weighing about five pounds, was in a state of congestive asphyxia. The cord was cut without ligature, and a small amount of blood permitted to escape; the infant was then quickly resuscitated.

When this child was delivered it was at once ob-

served that a second remained unborn, which presented by the head, in the left occipito-anterior position. It descended to the pelvic cavity in a little while, but the contractions being insufficient, the forceps was applied and delivery accomplished in a few minutes. The second child resisted efforts at resuscitation for a long while, but we were finally successful; though larger than the first, it was weaker, and was asphyxiated from a probable partially premature separation of the placenta. A single after-birth with the two cords attached was promptly delivered, and a firm uterine contraction followed.

The time consumed from the commencement of the dilatation to the complete delivery was about two hours, and we had the satisfaction of having two living children, the mother still alive and in a better situation for the future to the credit of *accouchement forcè*. Owing to the small size of the fetal heads, notwithstanding the unfavorable position of the first, the perineum was preserved entire, and if there was any cervical laceration, it was insignificant. There was no recurrence of convulsions during the delivery. The mother was now allowed to come out from under the influence of chloroform, and a close watch was instituted. In an hour or so she began to purge freely; the kidneys also secreted six or eight ounces of urine.

I saw her again four hours afterward and found her breathing sixty-five times per minute; the pulse, 90; the temperature, 102° F.; very restless, still unconscious, somewhat cyanosed, coarse mucous râles being heard over every part of both lungs. This condition, evidently one of acute edema, had come on suddenly, about three-and-one-half hours subsequent to the delivery. Mustard-plasters were freely applied to the chest in front and behind, a rectal injection of half an ounce of whiskey and fifteen grains of ammonium carbonate given, followed shortly after by the hypodermatic injection of morphin one-fourth grain and atropin $\frac{1}{10}$ grain. This brought relief, and she passed a reasonably quiet night.

At eight o'clock the next morning, April 3d, she awoke to partial consciousness, and had a single slight convolution; thirty grains of chloral by the rectum, and morphin and atropin were given. The edematous condition of the lungs still persisted; the temperature was 101° F., and the pulse varying from 120 to 150 beats per minute. Later in the morning the morphin and atropin were repeated, and $\frac{1}{10}$ grain digitalin given hypodermatically. At four o'clock in the afternoon the woman had become semiconscious, the pupils responding promptly; the pulse was 120—better in volume and strength; she recognized her friends and was able to swallow teaspoonfuls of water, doses of whiskey, and ammonium carbonate. I directed that morphin and digitalis be continued during the night *pro re nata*.

The temperature for the next two days was exceedingly erratic, varying from normal, or nearly so, to 105° F., making at times very rapid excursions, but the daily average became gradually higher toward the end, fluctuating from 103° to 105° F. The condition of the lungs never materially improved, the coarse mucous râles persisting. I am inclined to think a condition identical with, or certainly very similar to, catarhal pneumonia developed in the right lung. The urinary secretion from the time of delivery was satisfactory in quantity, showing daily improvement in the amount of

albumin. The patient died early on the morning of the 6th, or about four-and-one-half days after delivery, clearly from the pulmonary complication, there being at no time evidence of septic infection. It is probable that the edema was induced by intra-cranial interference with the functions of the pneumogastric nerve.

NO. 731 FOURTH AVENUE.

AN UNDESCRIBED HEART-MURMUR.

BY J. N. HALL, M.D.,

PROFESSOR OF THERAPEUTICS AND CLINICAL MEDICINE IN THE
UNIVERSITY OF COLORADO.

IN quite an extended search in the literature of diseases of the heart I have been unable to find any note of a murmur such as is here described.

Mrs. C., a widow, thirty-two years of age, a housewife, has borne four children and has had two miscarriages, the last being only a month ago. Ten years ago she had an attack of acute rheumatism confining her to bed for five months. She has had several slight attacks since. She lost considerable blood at the last miscarriage, and is rather anemic. Upon August 6th, when I first saw her, the cardiac area was enlarged to the mamillary line, the apex-beat under the nipple, in the fifth space, and the cardiac action decidedly feeble. An apical systolic murmur, propagated to the mid-axillary line was heard, with accentuation of the pulmonary second sound. There was moderate edema of the feet, and marked dyspnea; the respirations were fifty per minute while sitting in the chair, the pulse 90, and feeble. No pulmonary edema was found.

I exhibited the patient at the clinic as an example of mitral regurgitation, in spite of the fact that the murmur was not propagated to the back. The feeble action of the heart seemed to me sufficiently to account for this, while the lack of such transmission was in my mind more than counterbalanced by the presence of edema and particularly the marked dyspnea, especially upon the slightest exertion. In fact, I take decided exception to the dictum of Cammann and others, that it is necessary to hear a mitral murmur in the back before deciding that it indicates regurgitation. I believe I have seen several examples that were exceptions to this rule.

The woman was given iron and a laxative, and returned on August 29th. Her condition was then about the same, excepting that the anemia was a little improved, and the murmur followed the first sound and the apex-beat, instead of being synchronous with them as before. The cardiac action was still so feeble that digitalis was prescribed, and a few days later the patient was re-examined.

The edema of the feet at that time had practically disappeared. The pulse was 70, and of much better strength. The apex-beat was easily visible and palpable. The murmur followed the first sound, and the visible beat, and was transmitted to the mid-axillary line. The respirations reached 50 per minute five minutes after slowly ascending a short flight of stairs. The basic second sound came just at the termination of the murmur, but at the apex was obscured by it. The case was exhibited to many students, and to Drs. McLauthlin, Lobingier, and Hopkins, of the University of Colorado. There was no room for disagreement as to the facts, viz., that

the apex-beat and first sound, with a distinct movement imparted to the stethoscope, all preceded the murmur. The only explanation of this state of affairs which I can conceive, is as follows:

The mitral valve was incompetent, and regurgitation occurred through it, giving rise to the murmur, as is usual in such cases. The right ventricle, somewhat hypertrophied, gave rise to the apex-beat and a normal first sound, and displaced the stethoscope firmly applied to the apex region, forming the first element in a reduplication of the first sound of the heart. The second part of the reduplication was made by the left ventricle, but instead of a distinct heart-sound a mitral murmur was heard, owing to the regurgitation through the mitral valve. I believe this explanation sufficiently accounts for all the phenomena observed.

Barr has reported a somewhat similar case in which the left ventricle contracted first, with a mitral murmur, and was followed by the normal contraction of the right ventricle. Sansom reports a case in which, over the ventricles "a murmur tailed off from the second reduplicatory sound," at the apex only the murmur being distinguishable. The case later developed a presystolic murmur, and the reduplication disappeared, which would appear to confirm his explanation that it was due to a presystolic flap of the mitral valve. It obviously differs from the case we are considering.

George Johnson believed that reduplication occurs from the contraction first of the hypertrophied auricle, followed by that of the ventricle. It is not reasonable, I think, to suppose that the auricle could possibly cause the distinct apex-beat, even if it could cause the sound. Sansom has stated, nevertheless, that in certain cases of mitral stenosis the auricle may cause a distinct impulse. There has been, I believe, no evidence of mitral stenosis in this case, and I consider it opposed to Johnson's theory.

Hayden believed that the reduplication occurred from a resolution of the first sound into a muscular sound and a valvular element, the latter occurring after the former. It seems to be conclusively proved that the valve closes early in systole, however, and I certainly fail to see any bearing upon the present case. Potain's theory that reduplication is generally only apparent, being in reality due to a presystolic flapping of the mitral valve in association with a normal first sound, evidently would not apply here, as the apex-beat accompanied the first sound.

I hope to be able to follow the case, and shall note any further developments.

THREE UNUSUAL CASES OF ABSCESS.

BY M. A. VEEDER, M.D.,
OF LYONS, N. Y.

I HAVE had three cases of abscess recently that are somewhat interesting. The first, which pointed just above the sternum and was buried deeply in the muscles of the neck, was very refractory to treatment, until it was found that its cause was inflammation in the pulp-cavity of a tooth near the angle of the jaw, the pus from which had found an outlet on the inside of the jaw-bone, and had worked its way down between the muscles of the neck until it came to the surface, as I have de-

scribed. The patient had not suffered from toothache, and did not suspect that this was the source of the trouble, although when the tooth was pulled fluid could be made to pass through the sinus, and healing was very prompt thereafter.

In the next case the patient gave an account of having frozen his chin about three years previously, since which time it had been reddened, and at times would break open and discharge pus. He had never had any trouble with his teeth, which were even and regular, and apparently free from any trace whatever of caries. Nevertheless the probe entered a cavity in the bone at the tip of the chin in the direction of one of the lower incisors, which on inspection was found to present the peculiar opaque appearance which exists when the nerve is dead. He was taken to a dentist, and a hole was drilled into the side of the tooth, the center of which was found to be the seat of a cavity having its outlet below, and through which a disinfecting fluid could be readily passed into the sinus opening at the tip of the chin. This cavity was thoroughly cleansed by the repeated application of hydrogen dioxid and of pure carbolic acid and drilling, whereupon the pus-discharge ceased, and the tooth which had been the cause of the trouble was saved.

Another case was of precisely similar character, except that the opening was on the side of the chin opposite the anterior bicuspid tooth. Although the patient had not had the slightest pain in his teeth, when it was suggested that this might be the trouble he went to a dentist and had the posterior bicuspid tooth pulled because it contained a filling and the other did not. This did not remedy the trouble, and some months afterward he sacrificed the other tooth, which resulted in immediate cure. The better plan would have been to have looked for symptoms of the death of the nerve of the tooth, and to have had an opening drilled into the pulp-cavity as previously described, which would have resulted, with proper filling, in remedying the trouble and likewise saving the tooth. It has seemed to me that this class of cases might very readily be overlooked, particularly in the earlier stages, because of the insignificance of the pain referable to the teeth.

HOSPITAL NOTE.

ABDOMINAL ANEURYSM.

BY JOHN ALDEN LICHTY, M.D.,
RESIDENT PHYSICIAN IN THE PHILADELPHIA HOSPITAL.

Mrs. M. D., seventy-three years of age, a widow, born in Ireland, was admitted to the Philadelphia Hospital, in Dr. Salinger's wards, September 5, 1894. The woman said that she had always been well, had worked hard all her life, was the mother of ten children and had had four miscarriages. She had used alcohol, and to excess, especially within the last few years. For the past ten years she has suffered with dizziness. Within that time a small tumor appeared in the region of the thyroid gland. For three or four years she has had pain in the epigastric and cardiac regions. This, according to her statement, has shifted gradually toward the right. It is paroxysmal, not increased after eating, and shoots toward the back. The pain in the back has been especially severe within the last few months. About a month

before admission she noticed a pulsation on the right side and above the umbilicus. This she thought was due to her heart, and when asked why she came to the hospital, she said because her "heart was dislocated." She is a tall, slender woman, and looks emaciated, but says she has never been robust. The palpebral fissures are small, and there is a marked *arcus senilis*. The pupils are unequal, the right being smaller than the left, as the result of an injury to the eye some years ago. Both pupils respond to light and accommodate to distance. The woman's voice is high-pitched and harsh. Examination of the larynx by Dr. Seltzer showed the vocal bands to be normal. The larynx is unusually small.

A small tumor about the size of a walnut is found in the region of the thyroid gland, more prominent on the left side than on the right. It is very hard, nodular, does not pulsate, and moves with the larynx in deglutition. The left external jugular vein is much distended immediately above the clavicle. The lungs are normal. Cardiac dulness is normal in extent. At the apex a rough sound is heard with the systole. It is not transmitted. At the aortic cartilage the second sound is highly accentuated. The radial pulses are equal. The arteries are very much thickened.

The abdomen is very flaccid. On the right side of the median line and just above the umbilicus, an induration is felt. It is about the size of a lemon, smooth, very tender upon pressure, has an expansile pulsation synchronous with the heart-beat, and extends to the median line. No thrill is felt, but a bruit is heard at the base of the tumor near the situation of the abdominal aorta. The position of this tumor does not change upon putting the patient in the knee-elbow posture. The femoral arteries are very much thickened, but a sphygmographic tracing shows no difference between the pulsations of the two. Marked tenderness is found about the spines of the twelfth dorsal and first lumbar vertebrae, and at this same point a bruit is heard.

From these symptoms and signs a diagnosis of aneurysm of the abdominal aorta was made. The condition could easily be differentiated from a pulsating abdominal aorta by the presence of a tumor, and from other abdominal tumors by the presence of the expansile pulsation and the bruit.

The patient is kept in bed, is on a dry diet, and is given larger doses of potassium iodid. Aside from the pain in the back, she is comfortable.

As is well-known, aneurysms of the abdominal aorta are rare. Crisp, in his elaborate statistics of 551 cases of aortic aneurysms, found only 59 of the abdominal aorta. Many cases reported are found on the autopsy-table to have been only instances of pulsating aortas. But in the foregoing case, in which the abdomen is so flaccid and the tumor can be so easily palpated, there cannot be a doubt of the existence of an aneurysm.

MEDICAL PROGRESS.

Prostatic Hypertrophy Successfully Treated by Castration. —MEYER and HAENEL (*Centrbl. für die Krankheiten der Harn- und Sexual-Organe*, Bd. v, Heft vii, 1894, p. 329) have reported the case of a man, seventy years old, previously in good health, who suffered with marked prostatic hypertrophy, complicated by ammoniacal cys-

titis. The prostate was palpable through the rectum as a smooth, homogeneous, hard mass about as large as an adult fist. Lobulation was not appreciable. In the presence of alarming symptoms and in the failure of the usual palliative measures, castration was proposed as the final resort, and both testicles were removed. Recovery from the operation ensued without complication. In the course of a week a slight decrease in the size of the prostate could be determined. In the course of another week the organ had lost a third of its former size, while five weeks later still it had lost an additional third. Three weeks after this the gland was reduced to almost its normal size. The distressing symptoms also began to subside within a few days after the operation, and with the aid of antiseptic irrigation of the bladder a satisfactory condition was soon restored, the propulsive force of the bladder progressively increasing. Hand-in-hand with the improvement in the local condition the general state became better, and in a short time the patient was restored to comparative health.

Among the advantages of the operation of castration for the relief of prostatic hypertrophy are pointed out its facility of performance, its almost entire freedom from danger, and the likelihood of success.

MANSELL-MOULLIN (*The Medical Press and Circular*, No. 2889, p. 285.) reports the case of a man, eighty-one years old, who for a number of years had been troubled with occasional retention of urine, relieved by catheter with more or less difficulty and returning after an interval of a month or two. When he came under observation the bladder was greatly distended, and a catheter could not be introduced. Through the rectum the prostate was found to be much enlarged, smooth and hard. The bladder was aspirated above the pubes, and a large quantity of urine neutral in reaction and containing a considerable amount of pus was removed. On the following day small amounts of urine were passed at frequent intervals. The condition continued thus for about two weeks, subsequently growing progressively worse. It was impossible to introduce a catheter. The amount of pus in the urine increased, the cystitis became more aggravated and the patient's strength began to fail. The prostatic growth was now as large as a Tangerine orange. It was considered that a suprapubic prostatectomy involved to much risk. The chance of success if a suprapubic urethra were formed or a perineal drain were inserted was considered better, but in view of the patient's years the prospect was felt not to be a good one. Accordingly, castration was proposed and agreed to. The operation was performed with but slight shock and without rise of temperature. The wound upon the one side healed at once; that upon the other became infected and suppurated a little. From the day after the operation the urine passed more freely. On examination ten days later the prostate, felt through the rectum, was much smaller. Three weeks after the operation it had simply disappeared. An ordinary silver catheter entered without the necessity of more than the usual depression, and when the finger was introduced into the rectum all that could be felt was a fusiform thickening along the catheter not sufficiently large or dense to prevent the shaft being felt distinctly along the entire length. The bladder was beginning to regain power and the urine had become acid.

Gumma of the Parotid Gland.—MANDOWSKY (*Sonderabdruck aus der Aerztliche Praktiker*, No. 32; 1894) has reported the case of a woman, twenty-three years old, who for some time had observed a hard swelling below the lobule of the right ear, in the neighborhood of the parotid. It was related that a glandular swelling had been present in the same situation nine years before, but this had been removed. Subsequently a new swelling appeared which, for a long time, slowly increased in size, but recently had grown more rapidly. The tumor was somewhat larger than a pigeon's egg in size and firm in consistence. It appeared to be adherent to the surrounding structures, and was not movable upon the subjacent tissues. It felt elastic, as if surrounded by a firm capsule. Immediately beneath it was a second, smaller mass, about as large as a bean. Although the general condition of the patient appeared good, and there was no history of eczema or other chronic inflammation, the impression made was that of a tuberculous lymphatic gland. At the patient's request the tumor was extirpated. It was found to lie between the origin of the sterno-mastoid muscle and the ascending branch of the lower jaw, immediately beneath the ear. It was adherent to the surrounding structures, particularly to the parotid gland, from which it could not be separated, so that it was necessary to remove a portion of the gland. In addition to the main tumor, some nine or ten smaller glands were also removed. The subsequent course of the case was uncomplicated.

Macroscopically the large tumor presented the appearance of a fibro-sarcoma. Histologically it proved to be a *gumma*, which it is believed was of hereditary origin.

THERAPEUTIC NOTES.

Infiltration-Anesthesia.—An interesting series of experiments, the results of which have been corroborated by many subsequent observations in practice during a period of over three years, appear to demonstrate the greater effectiveness of intra-cutaneous, over subcutaneous, injection of the anesthetizing fluid in the production of local anesthesia. The principle of infiltration-anesthesia, as briefly stated by SCHLEICH, the originator of the method (*Therapeutische Monatshefte*, 1894, No. 9), is thorough infiltration of the entire field of operation with an indifferent fluid, which need not be an anesthetic. The needle is introduced beneath the papillary layer, and in a direction parallel to the surface of the skin. The injection is followed in a few minutes by the appearance of a white, anesthetic wheal. The foreign fluid fills the tissue-spaces, and forces out the blood and tissue-juices, and is most effective at a temperature of zero, Celsus. The anesthesia of the area of induced edema is said to depend on the pressure of the infiltrating fluid, on the temperature, and on the anemia of the tissues. Intra-cutaneous injection of distilled water, of 2 per cent. solution of sodium chlorid, of 3 per cent. solution of sugar or 0.02 per cent. solution of cocaine, will produce complete local anesthesia. A 1 per cent. solution of morphin, a 3 per cent. solution of potassium bromid, a 1 per cent. solution of methyl-violet, a 2 per cent. solution of caffein, will have the same effect, and this will be enhanced if these substances are dissolved in 2 per cent. solution of sodium chlorid.

Among the operations done under local anesthesia by this method are mentioned uncomplicated celiotomy, amputation of the mammae, removal of the axillary glands, nephrotomy, herniotomy, removal of sequestra, besides many minor operations.

In the following formulæ the morphin or codein is added for the relief of the pain subsequent to the operation; the second agent named also diminishes considerably the necessary dose of cocaine, which is added to render the injection painless, and so facilitate its application. Without the cocaine, the induced edema is quite painful for a minute or more, when complete anesthesia follows.

I.

R.—Cocainæ hydrochlorat.	0 2
Morphin. hydrochlorat.	0.025
Sodii chlorid. sterilisat.	0.2
Aq. dest. (sterilisat.) ad	100.0—M.
Adde acid. carbol. (5 per cent.) gtt 2.	

S.—Strong solution.

II.

R.—Cocainæ hydrochlorat.	0 01
Morphin. hydrochlorat.	0.005
Sodii chlorid. sterilisat.	0.2
Aq. dest. (sterilisat.) ad	100.0—M.
Adde acid. carbol. (5 per cent.) gtt. 2.	

S.—Weak solution.

The strong solution may be diluted three times with normal salt-solution without losing its efficacy. Undiluted, it is used in the treatment of inflammation, suppuration, or neuralgia. In an operation requiring much time, the weak and strong solutions are used alternately.

The syringe is sterilized by means of a 5 per cent. solution of carbolic acid and absolute alcohol in equal parts, and the pain incident to the first prick of the needle is obviated by the use of the ether or ethyl-chlorid spray.

The advantages of this method of producing local anesthesia are its perfect safety (as large quantities can be injected before the maximum dose of cocaine is reached) and the complete insensibility that can be induced and maintained in the entire field of operation.

To Relieve the Thirst of Diabetics pilocarpin may be administered in solution or in pill-form. The pills are best prepared by the addition of glycerin and gum arabic. Each contains gr. $\frac{1}{60}$ of pilocarpin nitrate.

For the solution the following formula is given:

R.—Pilocarpin. nitrat.	gr. $\frac{1}{60}$.
Spirit. vini dilut.	1xx.
Aquaæ	3j.—M.

S.—The tongue is to be moistened with 5 or 6 drops of this solution four or five times daily.—*Nouv. Remèdes*, No. 11; *Corr.-bl. für Schw. Aerzte*, 1894, No. 18.

For the Night sweats of Pulmonary Tuberculosis.

R.—Ext. secal. cornuti	3.0.
Spirit. dilut.	
Glycerini	5.0.—M.
Aquaæ dest.	

S. For subcutaneous injection: 1 c. centimeter at bedtime.—GOLDENBACH, *Deutsche med. Wochenschr.*, 1894, No. 26; *Therap. Monatsh.*, 1894, No. 9.

THE MEDICAL NEWS.

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OF MEDICAL SCIENCE.

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PERIODIC PALSY.

THERE have been reported within the last decade a small number of cases of obscure nature characterized by the occurrence of transitory and recurrent palsy, and for which it has not been possible to lay down a well-defined pathology. Among the earliest of these is one detailed by WESTPHAL,¹ which occurred in a boy twelve years old, who for a period of four or five years had attacks of paralysis of all four extremities, occurring at first every four or five weeks, and subsequently several times weekly, and lasting for from twenty-four to thirty-six hours. The paralysis was attended with loss of electric irritability of the affected muscles, diminution of reflex irritability, increased thirst, and free perspiration. Sometimes pain was present, and, as a rule, paresthesiae were noted.

A case recorded by GOLDFLAM² occurred in a young man seventeen years old, who for three years presented attacks of generalized paralysis, lasting at first for three days, later for two days, and finally for but one day, and recurring at intervals of varying duration. Eleven other members of the maternal branch of the family were said to suffer similarly. Males and females were almost equally attacked.

¹ Berliner klinische Wochenschrift, 1885, Nos. 31 and 32.

² Wiener medicinische Presse, 1890, Nos. 36-39.

The transmission was not continuous and direct, a generation sometimes escaping and the disease appearing in members of a succeeding generation. The frequency of the attacks varied considerably among the individual members of the family, although greater in youth than in advanced life.

BURR¹ has reported the case of a man, thirty years old, who for ten years suffered from attacks in which he was awakened from sleep by a sense of soreness in the muscles of the arms and legs, and on attempting to move found that he was unable to do so on account of weakness. Consciousness was undisturbed, sensibility was not deranged, and the function of the sphincters was maintained. The attacks lasted from a day to a week and recurred about once in four months, though latterly with greater frequency. Recovery from the attack took place gradually in the course of a few days. BURR further cites a case detailed by SCHACHNOWITSCH² occurring in a man, forty-four years old, who was subject to attacks of periodic paralysis, which always set in during sleep, and involved the arms and legs, without sensory derangement, but with a subjective sense of stiffness, lasting from three to twelve hours and recurring with varying frequency. Consciousness remained unaffected. It was learned that the patient's father had suffered similarly.

COUSOT³ has recorded the case of a mother and four of eight children who presented periodic paralysis. There have also been reported a number of cases of periodic palsy of quotidian or tertian or of irregular type, in which the causative factor was believed to be malarial, but quite without adequate evidence. Only in the report of GOLDFLAM is it stated that examination of the blood was made, and in this instance hematozoa were not found.

The most recent of this interesting group of cases is reported by HIRSCH.⁴ The patient was a man, twenty-six years old, who, about once a year for a period of six or seven years, was, without obvious cause or exciting influence, seized with a sense of heaviness and fatigue in the extremities, finally progressing to actual paralysis, lasting for about twenty-four hours and suddenly disappearing. The reflexes were abolished, but sensibility was unaffected. During the continuance of the condition there was increased thirst. There was also increased cardiac

¹ University Medical Magazine, August, 1893, p. 836.

² Vratch, No. 32, p. 537; London Medical Record, 1884.

³ Revue de Médecine, 1887, vol. vii, p. 190.

⁴ Deutsche medicinische Wochenschrift, 1894, No. 32, p. 646.

activity, and a systolic murmur was heard at the apex of the heart, together with accentuation of the pulmonary second sound. After the seizure the man was as well as before. The patient himself was not neurotic, but it was related that his mother had suffered similarly. In both the facial muscles escaped involvement.

Virtually nothing is known as to the intimate nature and etiology of the disorder here considered, and in the absence of definite knowledge hypothesis has had free play. WESTPHAL thought there might be a sudden disturbance of the nutrition of the muscles or of the muscle nerve-endings as a result of peripheral circulatory derangement. COUSOR sought to locate the lesion in the spinal cord, assuming the existence of a transitory inhibitory influence upon the spinal centers. GOLDFLAM suggested the presence in the body of a virus of unknown nature exerting a toxic influence upon the muscles and motor nervous fibers, and, as a matter of fact, demonstrated an augmentation of the urotoxic coefficient in relation with the occurrence of a paroxysm. From a prognostic point of view the affection is not known to shorten life. Therapeutically there is no specific remedy, and each case must be treated in accordance with its individual features.

An additional interest is given these cases when placed side by side with the affection described by THOMSEN and known by his name, and also as congenital myotonia, and that recently described by RICH.¹ In the first of these latter conditions stiffness of the muscles ensues on attempted movement following a period of rest, and in the second a similar rigidity results on exposure to cold, in both instances with interference with mobility.

In a personal communication PROF. BERNHARDT, of Berlin, calls our attention to a family form of congenital myotonia traceable through six generations described by EULENBERG,² and a case of intermittent congenital myotonia reported by MARTIUS and HANSEMANN.³ In the twenty-eight persons affected by the condition described by EULENBURG exposure even to a slight degree of cold

induced transient tonic spasm of the muscles of the face and neck and the muscles of deglutition, so that, for instance, the act of vision or of speech was rendered difficult or was interfered with; in the muscles of the lower and upper extremities the condition of spasm yielded to a state of palsy lasting from a few hours to half a day. Warmth relieved an existing attack and aborted an impending one. Faradic and, in greater degree, galvanic muscular irritability was diminished, the response to galvanism being unduly protracted. The affection differed from Thomsen's disease in an absence of increased mechanical irritability of the muscles. The condition was believed to be a spastic angio-neurosis, dependent upon reflex contraction of the vessels supplying the muscles, as a result of the irritation induced by exposure to cold.

The case of MARTIUS and HANSEMANN was characterized by a sense of weakness in the upper extremities following exposure to cold, or rather sudden lowering of temperature. During the summer the patient remained free from attacks for months at a time. Sudden exposure to cold, however, such as a cold bath, at all times led to an attack. In winter the attack would be repeated daily and usually in the morning, either on arising or going out of doors. It set in with a sense of progressive weakness, even before there was objective interference with motility. Ultimately the fingers became fixed in the clawed position. Passive motion, however, was still possible. The patient was, on vigorous effort, able to close the hand, but was unable at once to reopen it. The spasm relaxed in the course of a few seconds and the patient was again able to extend the fingers. Energetic innervation of the biceps brachii was also attended with prolonged tonic contraction beyond the period of voluntary stimulation. Sometimes the muscles of the face and of mastication displayed similar peculiarities. Only on one occasion, after putting the feet in cold water, was there any stiffness of the lower extremities.

The mechanical irritability of the motor nerves was diminished, that of the muscles tardy and characterized by protracted contraction. The response of the muscles to strong faradic currents was slow, tonic, and persistent; induction-opening sometimes induced only short, lightning-like contractions. Galvanic irritability of the nerves was normal and all of the contractions were brief. The muscles displayed increased galvanic irritability,

¹ MEDICAL NEWS, August 25, 1894, p. 210.

² Neurologisches Centralblatt, 1886, No. 12; Jahresbericht über die Leistungen und Fortschritte in der gesammten Medicin, xxi. Jahrgang, Bd. ii, p. 164.

³ Archiv für pathologische Anatomie und Physiologie und für klinische Medicin, Bd. 117, Folge xi, Bd. vii, p. 587; Jahresber. über die Leist. u. Fortschr. in der ges. Med., xxiv. Jahrg., Bd. ii, p. 76.

with qualitative change; all contractions were slow, with tonic and protracted wave-like elevations and depressions formed at the point of application of the electrode. In the intervals between the attacks the patient was free from all outward abnormal manifestations.

Histologic examination of a portion of one of the affected muscles showed the primitive bundles to be twice the normal thickness, pursuing an undulating course, with the transverse striation in places indistinct. The nuclei of the muscle-fibers were also increased in number, were wider than normal, and were arranged in long rows. The father, the grandmother, the great-grandfather, numerous uncles, an aunt, and other members of the family suffered similarly to the patient, the disease usually appearing in early childhood.

Although on first thought the several conditions here referred to would appear to be widely divergent, future investigation may disclose a more intimate relation among them, the same structures suffering in all—in the one instance, however, with the development of a flaccid or atonic state of the muscles affected, while in the other a spastic state results. All present in common a family distribution and hereditary transmission.

SMALL HOSPITALS.

A LITTLE book on the *Establishment and Maintenance of Small Hospitals*, by A. WORCESTER, A.M., M.D., has lately been published by JOHN WILEY & SONS, New York. It was written to aid in the now widespread movement for the establishment of small hospitals in all centers large enough to support them. After discussing the advantages of the small hospital, the means to be taken to awaken an interest in the movement in any community are stated; the necessary hospital-organization is explained; the medical question is fully discussed, and the necessity (as it is believed) shown of having all the leading schools of medicine represented on the hospital staff. This is done by naming leading physicians of each "school," who are, however, designated simply as physicians, the "regular" physicians serving in turn, the homeopathic members of the staff being in attendance whenever called for by patients.

The necessity of a training-school is shown, and DR. WOODWARD recommends that this be an entirely separate institution from the hospital. For

this we see no good reason, and the valid objection that it imposes upon a small community the necessity of maintaining two establishments, when only one is necessary, seems sufficient to overthrow his plan.

DR. WORCESTER takes the stand that the hospital should provide for all needful cases of contagious disease, and this he recommends should be done in a detached cottage-ward. It has been the rule at hospitals to reject all patients suffering from contagious diseases, but this is no longer defensible in communities in which there are no special hospitals for these diseases. The greatest need is often in these very cases, in which, unless removed to a hospital for isolation, the disease may spread through a whole family.

The closing pages of the book are devoted to "Suggestions for Hospital Architecture, with Plans for a Small Hospital," by WILLIAM ATKINSON, architect. The book is commended to all who contemplate the establishment of a hospital in any community in which none now exists.

It may be profitable to refer here to the success which is attending the efforts to establish small hospitals, and to illustrate this by referring to the hospital opened a little more than a year ago at West Chester, Pennsylvania. The building and lot cost \$20,000. There are twenty beds in the wards, and private rooms for patients. The cost of maintenance is \$250 per month. During the first year 169 patients were received, who spent on the average sixteen days in the institution. During the year, the hospital received \$22,000 as an endowment-fund, which is now invested at 5 per cent., and a collection taken for it in the Catholic Church yielded over \$700. A school for nurses has been established and is in successful operation. It is in charge of a committee of the Board of Managers.

The field which it is the aim of this hospital to occupy is the whole county in which it is situated. The county-seat being in communication with all portions of the county by railroad, patients can be quickly and safely conveyed to it. An ambulance is also employed to bring in patients from the surrounding country.

To work up and maintain an interest in the hospital and to secure funds and supplies *Ladies' Auxiliary Societies* have been established at numerous places throughout the county. These societies receive annual subscriptions and donations. Some of the churches in the district have taken up collections

for the hospital, others have not. Such small county-hospitals, properly managed, and escaping the evils which have beset larger institutions, should be able to accomplish great good, if in no other way, in avoiding the congestion of city-hospitals, a large part of which is due to the custom of the counties supplying many patients who in one way or another find their way to the city. But all care should be exercised in founding, in framing rules, and in the administration of these and of all hospitals, that dependency is not encouraged, that those who are able to pay shall not be treated without payment, both the profession and the public being thus injured.

EDITORIAL COMMENTS.

An Appeal to the Pity and Better Natures of the Editors and Publishers of The British Medical Journal and The Lancet.—You know, gentlemen, that the paper upon which is printed the "foreign edition" of your otherwise splendid journals, is simply inexpressibly vile. It is at once thicker, and yet more mushy and rotten than tissue-paper, and is, therefore, properly fit for no purpose whatsoever—absolutely none—of civilized or unregenerate man. We can only explain its use on the ground of a contempt of us, the reason for which dates back to Revolutionary times, or perhaps to Simian ages. You certainly would not, and could not, treat a resident of the British Islands thus. We beg of you to remember that, however remote the relationship, we are at least your Teutonic brethren, and that it is your duty to help on the cause of Anglo-Saxon civilization. Please do not forget that even an American can sometimes grumble, and even revolt, after prolonged indignity and injustice. We appeal to your compassion and to your sense of justice: In the name of your contributors, who write to be read of all men, not only of Englishmen; in the name of your foreign subscribers, who have paid for knowledge, not soiled paper; in the name of your typesetters and printers, whose good work is spoiled by your bad paper; in the name of your self-interest, as there are untold thousands of Americans waiting to subscribe when they shall be able to read what you and your contributors have written; in the name of medicine, whose cause you represent, but traitorously, because you spoil good eyes and brains by the unnecessary labor you thrust upon us; in the name of art, as the illustrations in the foreign editions of your journals become subjects of mirth to all outlandish men; in the name of human ethics and good character, because you are sadly wrecking both, and tremendously increasing the work of the future writer of a cursory history of swearing; and lastly, in the name of pure commiseration of your brother editors who, willy-nilly, are compelled to look through your columns to glean from them a knowledge of medical thought and progress. Misericordia! Misericordia!

State Examinations and Licenses to Practice.—A correspondent complains of the non-issue of the formal license

to practice, and indulges in general criticism of the conduct of the Pennsylvania Board. Concerning the non-issue of the formal license, it will be proper to apply directly to the Attorney-General of the State. The law, we believe, does not prescribe any printed or written form, and a license to each successful applicant might be issued by proclamation or by simple notice to each person. On the question of the value of strict examinations and the establishment of a State Supervising Board, it may be said that all experienced teachers admit that ability to answer set questions is not a test of talent or genius. Those who carry off college honors are by no means always those who are the most distinguished in after life. It is true that many able physicians have been educated under the wretched system common in the United States up to a recent period, but it is also true that hosts of unfit men were allowed to enter the profession and a degradation of the standard of the schools brought about which is the main factor in retarding reform. To attempt to regulate by legislative methods the scope of instruction in medical schools would lead to dispute and confusion. The utmost that can be accomplished at present is to exercise the wholesome influence that arises from the fact that each college faculty knows that its graduates will be subject to a public competition with graduates of every other college. Moreover, if Pennsylvania were to establish a system of college supervision the graduates of other States could not be excluded except by some uniform test like that of a State examination, so that nothing would be gained over the present method by the additional machinery.

Actual Experience in Filtration.—We take from a recent report of a joint commission designated by various civic and scientific organizations in Allegheny County, Pa., an interesting description of the performance of sand filters at Poughkeepsie, N. Y. These were built upon the European model in 1865, and have been in use over twenty years. They furnish 3,000,000 gallons per day. Since 1876 the beds have been used continually except during the winter of 1881, when the cold weather interfered. This difficulty has now been overcome, and they can be operated at all seasons. All the city supply is filtered, and the inhabitants have become very exacting, insisting on the continuous use of the filters. For brief periods in the year a peculiar turbidity appears which the filter does not remove. The lower courses of broken stone and gravel have never been disturbed since the filter was built, and the sand has also been in continuous use, having been several times removed, washed, and replaced. Chemic and bacteriologic analyses are always satisfactory. In November, 1891, Drown found 1161 points of microbial life in 1 c.c. of the applied water and 62 points in the effluent, a reduction of 95 per cent. In 1892 the reduction was 82 per cent.

Cruelty Among the Hindus.—HARI KALI SEN, himself a Hindu, in a recent number of the *Indian Medical Record* (Vol. vii, No 5, p. 136) details a form of refined cruelty practised among the higher castes of Hindus under the guise of a religious observance and known as Akadashi, which compels widows, infant or mature, healthy or sick, weak or strong, to observe on the eleventh day succeeding each full moon and new moon a fast lasting for twenty-four

hours, during which not so much as a drop of water is permitted to pass their lips. Sometimes a widow is placed in an empty room and kept under lock and key for the time of her fast. Marriage takes place early among Hindu girls, even at the age of seven or eight. The male Hindu is not only entitled to polygamy during his first wife's lifetime but after her decease he may also marry as often as he pleases. On the other hand a Hindu widow of even six or eight or ten years of age, instead of being permitted to marry again, is forced to life-long torture, from which there is no release but death or prostitution.

The Polk Site for the Asylum for Feeble-minded in Western Pennsylvania.—Serious objection has been raised to the selection of Polk as the site for the contemplated asylum for feeble-minded in Western Pennsylvania, on the basis of its great distance from Pittsburg as representing the center of population of that section of the State. Not only will this separation increase the expense of travel of patients and friends, but it will also preclude the possibility of obtaining the strongest corps of visiting physicians, a desideratum, the importance of which has been recognized and illustrated in recent changes made in the medical staff of the Institution for Feeble-minded Children, at Elwyn, near Media, and not far from Philadelphia. There are many reasons why the new institution should be situated near Pittsburg. The energetic protest of the medical profession against the selection of the Polk site should not go unheeded.

The Vitality of Diphtheria-Bacilli in False Membrane.—We have on several occasions pointed out for how long periods convalescents from diphtheria may be a source of infection, and wish here only to refer to a report made by ABEL (*Deutsche medicinische Wochenschrift*, 1894, No. 35, p. 692), detailing the case of a girl, twelve years old, in which an attack of faecal diphtheria was, after apparent recovery, followed by the development of fibrinous rhinitis in the membranes, in which virulent diphtheria-bacilli were found as late as sixty-five days after the onset of the primary illness. This observation and others emphasize the caution to be observed in permitting convalescents from diphtheria to associate with others, and seem to show that the false membrane of diphtheria, as well as that of fibrinous rhinitis due to the activity of diphtheria-bacilli, constitutes a specially favorable medium for the preservation of these organisms.

Price No Guarantee of Excellence.—A few days ago a sample of hydrogen dioxid of English manufacture was analyzed in comparison with a well-known American brand. Four ounces of the English preparation cost one dollar, while the same quantity of American article costs about thirty cents. The results are interesting:

	Volumes of O.	Degree of acidity.
English	5.6	36.0
American	10.0	2.4

A sample of an American article which was ten volumes in strength in February last, and had been standing on the laboratory-table all summer, was found to

have been reduced to eight volumes, showing, therefore, excellent keeping qualities.

An Antiseptic Suggestion.—A contributor to THE NEWS, Dr. Francis L. Haynes, notes that in examining the neat and doubtless thoroughly sterilized packages of surgical dressings now kept in drug-stores, the physician is frequently startled to see the druggist open the packages and handle their contents with soiled fingers, thus rendering the material unfit for surgical purposes. He offers the suggestion that manufacturers carefully seal all packages of surgical dressings (and, we would add, permit the sale only of unbroken packages), and that physicians refuse to accept any materials the purity of which is not thus guaranteed.

Effect of Filtration of Water-Supply.—The beneficial effects of filtration seem to be strikingly shown by the experience of Girard College, Philadelphia. This is located in the district which has been for some years supplied by direct pumpage—that is, the Schuylkill water is thrown directly into the pipes. The typhoid death-rate for 1893 was quite high in that district, although apart from the bad water the sanitary conditions are very favorable. At Girard College, however, there is but little of the fever in a population of over 1500. All the water supplied to the institution is thoroughly filtered.

SELECTION.

PAY WARDS AT THE GREAT NORTHERN HOSPITAL.

We read in a lay contemporary: "The authorities of the Great Northern Central Hospital announce that on October 1st they will open their pay wards to the public. Particular care will be taken to restrict the benefits of this important branch of the charity to the most suitable and deserving cases. *The medical staff have undertaken to attend the patients gratuitously on the same conditions as the patients in the free wards.*" (The italics are ours.) This seems very strange. The persons then who make use of these wards are to pay for everything except medical attendance. It certainly looks like playing the medical profession a little lower down even than usual. These patients might just as well go to a cheap hotel and pay for their room, their food, and their nursing, but refuse to pay their doctor. We have an idea, however, that it may be a kind of sop to the general practitioners of the neighborhood, who, if they lifted up their voices in protest at pay wards, would be told: at any rate the medical attendance is not paid for. Yet it seems to us in these days of competition and low fees amongst general practitioners that persons who can afford to go into a pay ward at a hospital, even though the medical attendance is gratis, could all the more afford to stay at home and pay the general practitioner his fees, which, as time goes on, get smaller and gradually less. Pay wards at general hospitals should be on the same basis as private hospitals for important operations. But in all cases the medical attendant should have his fees exactly as if the case were that of an ordinary private patient.—*Med. Press and Circular.*

CORRESPONDENCE.

THE JOHNSTON EMERGENCY HOSPITAL
AT MILWAUKEE.

To the Editor of THE MEDICAL NEWS,

SIR: Something over six years ago the institution styled "The Johnston Emergency Hospital" opened its doors for the reception of patients. The first conception of the idea occurred to Dr. A. B. Farnham, Harv. A. B. 1867, and Bellevue M.D.

Previous to its foundation a number of lives had been lost from the delay in "first attendance," and much inconvenience had been experienced by the police in not having satisfactory quarters for wounded and sick criminals. There were many hospitals in and about the city, but they were far from the center of possible accidents, and their rules and regulations did not permit them to take all persons that might apply. Dr. Farnham was aided in his efforts by the members of the medical society, then called "The Bartlett Clinical Club," now known as "The Milwaukee Medical Society."

By hard work \$1500 were collected. Some of the leading men of the city were chosen as directors. An abandoned police-station was renovated, disinfected, and rendered habitable if not aseptic. A graduate from the "Training School for Nurses" of the Cook County Hospital, Chicago, was selected as matron of the institution, and a pupil-nurse from the Wisconsin Training School for Nurses as her assistant. Trusting in the maxim, "The Lord will provide," the doors were opened, and since that time it has done more good than any other institution in the city. The first year was a struggle we well remember. We would meet Farnham with tears in his eyes and the information that there was not coal enough for a day, and this in midwinter, with the thermometer at 0°. Then we learned how to beg, and with a good cause behind us we did beg. During the first year much good that the public could see was accomplished. At one time fifteen firemen who had been engulfed in a burning building were kindly attended to. These acts of mercy gained the hearts of the Common Council, so that at the end of the first year the institution became a city one, with a fair appropriation, and governed by a board of directors appointed by the mayor, who in their turn appointed the visiting staff.

The old place was retained, and, notwithstanding the surroundings, much good work was done. Two years ago, while a cellar was being dug for a new building on the north side, the wall bulged outward, carrying away beds, etc., with a portion of the building. A meeting of the staff was called, and a resolution was sent to Common Council, asking for a new building. The "many-headed hydra" arose, and enemies to advancement wished to close its doors; other hospitals that had formerly refused the admission of such patients, now, in the hour of distress, offered to aid without recompense. While consulting as to where we should build or rent, one of our best philanthropic citizens, John Johnston, banker, arose and presented the city with a \$25,000 lot, in the heart of the manufacturing portion of the city and contiguous to the great Union Railway Station.

No position could have been more advantageous, no gift more timely. The gift of the lot was received, but

the erection of the building was delayed until the time left for its completion by the condition incorporated in the deed had been nearly spent. Then the Council stirred itself. Plans for a thoroughly fireproof building, in which all the modern practical as well as theoretic hospital-improvements were incorporated, were placed before the Trustees and Common Council for consideration; one of these was selected, and the work went on.

To-day, six months after the breaking of ground, we take pride in drawing the attention of the medical profession of the world to this "house of mercy" and this monument to the beneficence of a noble man. It will be known as "The Johnston Emergency Hospital." In years to come, long after all of us who have assisted at its birth shall be resting in our narrow house, the name of Johnston will still be read over its door, and the poor man, by accident a sufferer, will bless his name as a public benefactor.

The hospital is built on Sycamore Street between Third and Fourth. The Fourth Ward Park is immediately in front. On the east side runs a twenty-foot alley, which gives ample room for the ambulance to drive in, turn, and back into the recess at the side, between the two sections of the building. The gates are then closed, and the patient can then be taken from the ambulance into the elevator without the "gaping curious crowd" encumbering the way. The building is fifty feet by one-hundred-and-thirty feet, leaving twenty feet of space in the rear for a stable, wherein to keep the ambulance, which will be erected in due time.

The cost of erection has been \$51,000. The front is built with Bedford limestone, combined on the second story with Roman brick, and on the third-story roof with Akron tile. The remaining walls are of Milwaukee brick. The building is thoroughly fireproof. The plan of construction is perfect throughout. Much praise must be given to John A. Moller, the architect, for the artistic and useful building he has added to our beautiful city. Each department is so arranged that it can at any time be shut off from the rest of the building. The four executive rooms on the first floor are separated from the rest of the hospital by glass doors. The ward for suspected infected cases has its own entrance on the side, and cannot be entered from the hospital proper. All cases are taken in from the ambulance at the side door to an elevator which, being raised to the second floor, gives the choice of conveying the patient directly either to the sunstroke-room, the preparation-room for operating, the female ward, or the obstetric ward, which is so constructed that it may be closed from the rest of the building. The kitchen and housekeeping apartments are in the basement and on the first floor.

The second floor back is taken up with the operating-room, preparation-room, and sunstroke-room. The resident physician has his apartments on the first floor and the attendants are across the hall. The dispensary is situated on the second floor, in the center of the building, and has electric connection with every room in the hospital. The janitor has his apartments in the front of the basement. Seclusion-rooms are provided for both male and female patients. The plumbing is perfect, there being a toilet-room to every set of apartments throughout the building. The operating-room has eight windows on two sides, and is lighted from

above by a skylight over the whole ceiling. A number of rooms have asphalt floors. The operating-room is of Georgia pine, filled, and oiled.

The ventilating and heating system is that of the Sturtevant Company of Boston, and governed by the Johnston Electric Service of Milwaukee for regulating the degree of heat. By experiment it has been found that the air can be changed throughout the building every ten minutes. The third floor is as yet unfinished, but can be utilized in case of a severe disaster, and can accommodate one-hundred beds. As the city increases in size this floor can be finished and used as a retention-ward.

I have described these plans in detail, as I think they are worthy of merit, and may be of service to other cities whose officials are thinking of constructing a similar institution. The hospital is furnished as perfectly as it is constructed, and nothing is wanted to render the institution a model throughout.

The hospital has a Board of Trustees appointed by the Mayor, eight of whom are physicians. Besides the regular business, they appoint the staff on its own recommendation. The Trustees are: Louis Frank, M.D., President; A. E. Smith, Secretary; S. W. French, M.D.; F. E. Walbridge, M.D.; John R. McDill, M.D.; Horace M. Brown, M.D.; J. S. O'Brien, M.D.; A. J. Burgess, M.D.; Walter Kempster, M.D. (Com. of Health).

The staff is composed of twelve physicians and twelve surgeons, three obstetricians, two ophthalmologists, five railroad surgeons, and eight members of the consulting staff.

I offer this article to the readers of THE MEDICAL NEWS with a pardonable pride, to show that the city of my adoption has contributed her portion to suffering humanity.

Yours fraternally,

SAMUEL W. FRENCH.

MILWAUKEE, WIS., October, 1894.
1216 GRAND AVENUE.

THE BUBONIC PLAGUE IN SOUTH CHINA.

To the Editor of THE MEDICAL NEWS,

SIR: The bubonic plague began in Canton and Hong Kong in February or March, but it did not come under the notice of foreigners until April or May. I landed in Hong Kong on the 15th of May and found the city in a state of excitement on account of the plague. The Colonial Government was inaugurating measures to combat the epidemic, and thousands of people were leaving the city.

In Canton the mortality was alarming, and the inhabitants were escaping to the country in large numbers.

The disease had been prevailing for several years in the southwestern part of the Canton province, and had come under the notice of medical missionaries, by one of whom it was described in the *Customs Medical Reports*. It gradually extended up the coast and, as already stated, reached Hong Kong and Canton in the early part of the year.

In Canton it first appeared in the eastern part of the city; then in the central part, and it gradually extended to the western suburbs. Cases have occurred in almost every part of the city, and in some localities the fatality has been great.

There is no notice taken of deaths, even in an epidemic, by the authorities of Chinese cities, and, of course, no statistics of mortality exist. The estimates of the number of deaths vary from 20,000 to 100,000, and even higher.

The disease is a malignant fever, running its course in violent cases in two or three days, but often continuing for four or five days, before the fatal termination occurs. If the patient passes the fifth day without dangerous complications there is hope of recovery.

The diagnostic symptom of the plague is a painful glandular swelling, either in the groin or axilla or neck. This usually appears on about the second or third day, or it may be earlier or later. In some cases the patient may die before the swelling takes place.

The fever varies in intensity, and may not be over 103° at first in cases which terminate fatally, but usually it gets up to 105° before the end. In some cases under our care intermissions have occurred, giving hope of recovery, but the fatal issue occurred on the following day.

Hemorrhage from the mouth and nose is occasionally observed, and the disintegration of the blood, with extravasation into the skin, has given rise to the term black plague or black death.

The presence of fever in association with the glandular swellings makes the diagnosis easy when an epidemic is prevailing, but this cannot be positive until the glandular swellings appear or the case is violent and rapid in its course.

The prognosis is uncertain, but it is unfavorable when the disease is epidemic, even in cases which seem mild. When the patient survives till the fifth day the disease may go on steadily to a fatal termination, but if the fever decreases and there are no brain-complications a favorable result may be hoped for.

A Japanese physician, Dr. Kitasato, has the credit of having discovered the bacillus of the plague. He was a pupil of Dr. Koch, at Berlin, and was sent to Hong Kong by the Japanese Government to study the epidemic. Unsanitary conditions are supposed to favor the development and dispersion of the bacilli, and most favorable fields for its propagation existed both in Hong Kong and Canton. But in the former place the most stringent measures were adopted by the Government, under the direction of the ablest physicians, to isolate the cases and limit the disease. In Canton nothing whatever was done by the Government either to isolate cases or to remove unsanitary conditions. If statistics could be had, it would be interesting to compare the results in the two places, but no means of comparison exist.

It is to be stated, however, that the epidemic ran its course *pari passu* in the two cities, and declined and disappeared at the same time in both.

The pathologic changes produced by the disease are yet for the most part to be studied. Locally, the glandular system is involved, and morbid changes in the blood are manifest, and in many cases a semi-comatose condition indicates that there are changes in the brain. The physicians in Hong Kong who gave special attention to the study of the disease will no doubt publish the results of their investigations. Post-mortem examinations cannot be made in Canton.

The most important element in the treatment is to

remove patients from the crowded unsanitary localities and dwellings where they are attacked. Temporary hospitals were opened in Hong Kong and Canton, where fresh air was abundant and proper attention could be given by trained nurses. Plague-patients brought to the Medical Missionary Society's Hospital were placed in boats anchored in the river, but we lacked the important element of trained nurses. In the native hospitals (large mat sheds) the ventilation was all that could be desired, but the nursing was deficient.

In regard to medical treatment, the rapid progress of the disease gave little room for testing the value of any method.

We treated the fever on general principles, using some antiseptic internally. Because of the depressing influence of the poison, antipyretics had to be used with caution. The mental depression was one of the most unfavorable symptoms, and was, no doubt, responsible for many deaths. One of our patients who had been an attendant on other patients gave up all hope as soon as the glandular swelling appeared.

The probability is that the disease will reappear next year, as it has prevailed for two or three years in succession in the districts southwest of Canton. It has extended to towns and cities which are in direct communication with the provincial capital, and its course in a northerly direction will be watched with much interest. It has now almost entirely disappeared from Canton and Hong Kong.

Respectfully,
J. G. KERR.

CANTON, SEPT. 10, 1894.

NEWS ITEMS.

Football Casualties.—On Saturday last the following accidents occurred: During a match between the Blackburn Rovers and Burnley teams, a Burnley player fractured his leg, and another "injured his ankle." At Tottenham Marshes a player fractured his right leg, and another player, in a match close by, dislocated his patella. In a match at Idle, between the Windhill and Idle teams, a player fractured his spine and died on the following day.—*Lancet*, September 29, 1894.

A football player, named Hudson, was killed, or rather killed himself, at Shipley, on September 22d. He charged the forwards, and so injured his neck and spine that he died on the following day. Our recent remarks on the dangers attending the present style of play and the need of some revision of the rules have excited the indignation of certain friends of the game; but such incidents as this serve to prove that the best friends of this sport are those who desire to see it shorn of those elements which tend to brutalization. The reports state that during the game at which this accident happened there was so much roughness that three players were ordered off the field. We trust that the comments we have recently made, which have been, we are glad to see, quoted extensively throughout the press, will have the effect of strengthening the authority of umpires and of encouraging them to interfere in time to prevent the repetition of the disasters which during recent years have outraged public sentiment.—*Lancet*, October 6, 1894.

Three Harvard players have been injured in one week.

Arthur Brewer was hurt in the Orange game, and Waters and Mackie will not resume work till the last of the week.

"Ans" Beard was not at the field to-day, and inquiry to-night brought forth the fact that he has gone home to Poughkeepsie, N. Y. He had been complaining for several days of soreness, and has developed some stomach trouble. How serious that trouble is has not been learned.—*The N. Y. Herald*, October 16, 1894.

For a Better Milk-supply.—The Philadelphia Board of Health has instructed the Chief Inspector of Milk to indorse as untrustworthy all certificates testifying to the freedom of herds of milch-cows from tuberculosis that are not based upon the use of the tuberculin-test by trained veterinarians. A register is to be kept in which shall be recorded all herds of milch-cows that supply the city of Philadelphia that have been certified as free from tuberculosis by the method approved by the Board of Health, as well as such as have not been reliably certified and which are to be designated as "suspicious." These records shall also contain the names of dealers supplied from the various herds and shall be open to the inspection of the public. All producers of milk supplying the city of Philadelphia who fail after sixty days' notice to furnish a certificate or clean bill of health of their cattle, based on the method of examination demanded by experts and approved by the Board of Health, shall be reported to the Board and be liable to have their milk rejected as being suspicious.

Meetings of Philadelphia Medical Societies:

	Meets.	Next meeting.
Academy of Surgery,	1st Monday of month, Oct.—June.	Nov. 5
College of Physicians,	1st Wednesday of month, Sept.—June.	Nov. 7
Section of Ophthalmology,	3d Tuesday of month, Sept.—May.	Nov. 20
Section of Orthopedic Surgery,	3d Friday of month, Oct.—April.	Nov. 16
Section of Otology,	1st Tuesday of month, Oct.—May.	Nov. 6
Section of Surgery,	2d Friday of month, Oct.—May.	Nov. 9
County Medical Society,	2d and 4th Wednesdays of month, Sept.—June.	Oct. 24
Neurological Society,	4th Monday of month, Oct.—April.	Oct. 22
Obstetrical Society,	1st Thursday of month, Sept.—June.	Nov. 1
Pathological Society,	2d and 4th Thursdays of month, Sept.—June.	Oct. 25

A Course of Ten Lectures on the History of Medicine will be given in Alumni Hall (College Building) of the Medical Department of the University of Buffalo, by Dr. Roswell Park. The first lecture was given on Octo-8th, at 8.15 P. M. Subsequent lectures will occupy each succeeding Monday evening till the course is completed.

These lectures have been so prepared as to treat of political, religious, philosophic, and other issues which have influenced the progress of the medical sciences. They are open to all who are interested in the subject.

Dr. W. F. Howard, Jr., has been elected associate professor of pathology in the Western Reserve University.